Weeks Bay
National Estuarine Research Reserve

Management Plan

January 2007

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Acknowledgements

This management plan has been developed in accordance with NOAA regulations, including all provisions for public involvement. It is consistent with the congressional intent of Section 315 of the Congressional Zone Management Act of 1972, as amended, and provisions of the Alabama Coastal Area Management Program.

The revision of the 1998 Weeks Bay National Estuarine Research Reserve Management Plan was made possible through the cooperative efforts of the Weeks Bay NERR staff, the Weeks Bay Advisory Committee, the Alabama Department of Conservation and Natural Resources State Lands Division-Coastal Section, and National Oceanic and Atmospheric Administration Estuarine Reserves Division staff.

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This publication is available for downloading at http://nerrs.noaa.gov/WeeksBay/welcome.html.

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List of Abbreviations

ACAMP	Alabama Coastal Area Management Plan
ACES	Alabama Cooperative Extension System
ADAI	Alabama Department of Agriculture and Industries
ADCNR	Alabama Department of Conservation and Natural Resources
ADECA	Alabama Department of Economic and Community Affairs
ADEM	Alabama Department of Environmental Management
ADID	Baldwin County Wetland Advanced Identification
AL	University of Alabama
ARP	Area for Preservation and Restoration
AU	Auburn University
AUMERC	Auburn University Marine Extension and Research Center
AWW	Alabama Water Watch
BCC	Baldwin County Commission
BCBE	Baldwin County Board of Education
BMP	Best Management Practice
CAC	Weeks Bay Watershed Project Citizens Advisory Committee
CDMO	Central Data Management Office
CICEET	Cooperative Institute for Coastal & Estuarine Environmental Technology
COE	U.S. Army Corps of Engineers
CRP	Conservation Reserve Program
CTP	Coastal Training Program
CWA	The Clean Water Act
CZM	Coastal Zone Management
CZARA	Coastal Zone Act Reauthorization Amendments
CZMA	Coastal Zone Management Act
DISL	Dauphin Island Sea Lab (see also Marine Environmental Sciences Consortium)
EIS	Environmental Impact Statement
ERD	Estuarine Reserve Division
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act
FDA	Food and Drug Administration
GAPC	Geographic Area of Particular Concern
GEMS	Gulf Ecological Management Sites
GIS	Geographical Information System
GOMF	Gulf of Mexico Foundation
GPS	Global Positioning System
GRF	Graduate Research Fellowship
GSA	Geological Survey of Alabama
MASG	Mississippi-Alabama Sea Grant
MBA	Migratory Bird Treaty Act

MESC	Marine Environmental Sciences Consortium (see also Dauphin Island Sea Lab)
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
NCP	National Contingency Plan
NEP	National Estuary Program
NEPA	National Environmental Policy Act
NERR	National Estuarine Research Reserve
NERRS	National Estuarine Research Reserve System
NMFS	National Marine Fisheries Service
NMSP	National Marine Sanctuary Program
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NPDES	National Pollutant Discharge Elimination System
NPS	Non-Point Source (Pollution)
NRCS	Natural Resources Conservation Service
OCRM	Office of Ocean and Coastal Resource Management
ONRW	Outstanding National Resource Water
OSDS	Onsite Sewage Disposal Systems
RCD	Resource Conservation and Development
SAV	Submerged Aquatic Vegetation
SLD	State Lands Division
SWCD	Soil and Water Conservation District
SWMP	System-wide Monitoring Program
TIC	Technical Interagency Committee
TNC	The Nature Conservancy
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WHIP	Wildlife Habitat Incentives Program
WMA	Watershed Management Authority
WRP	Wetlands Reserve Program
WBWP	Weeks Bay Watershed Project

Executive Summary

In 1972, Congress passed the Coastal Zone Management Act (CZMA). In the CZMA, and in subsequent re-authorizations, Congress officially recognizes that resources of the coastal zone are of national significance, and are rapidly disappearing. The CZMA also recognizes the interrelationships between uplands and tidelands -- the "coastal zone" was defined in the Act as including all uplands "to the extent necessary to control shore lands." Section 315 of the CZMA establishes the National Estuarine Research Reserve System (NERRS). Under the System, healthy estuarine ecosystems which typify different regions of the U.S. can be designated and managed as sites for long-term research, and used as a base for estuarine education and interpretation programs. The System also provides a framework through which management approaches, research results, and techniques for estuarine education and interpretation can be shared with other programs. The NERRS was established by the CZMA to help address the problem of current and potential degradation of coastal resources brought about by increasing and competing demands for these resources. Prior to establishment of the NERR system, the management of estuarine resources was inadequate, and scientific understanding of estuarine processes necessary for improving management was increasing slowly and without national coordination. There were no ready mechanisms to detect trends in estuarine conditions, or to provide information on these trends, the overall significance of estuaries, and possible solutions to the growing problems. The NERRS is one part of the solution for maintaining healthy coastal resources. NERRS research, education, and resource stewardship programs are tools that can help fill gaps in knowledge, and guide decision-making so that our estuaries can sustain multiple uses over the long term.

In February, 1986, Weeks Bay was officially designated as the nation's 16th National Estuarine Sanctuary. In April, 1986, concomitant with 1986 amendments, the name of the Sanctuary was changed to the Weeks Bay National Estuarine Research Reserve (WBNERR). The Alabama Department of Conservation and Natural Resources (ADCNR), State Lands Division (SLD), Coastal Section is the cooperating state agency. The mission of the Weeks Bay National Estuarine Research Reserve is to:

> Provide leadership to promote informed management of estuarine and coastal habitats through scientific understanding and encourage good stewardship practices through partnerships, public education, and outreach programs.

Weeks Bay is an estuarine system, located along the eastern shore of Mobile Bay in Baldwin County between the major metropolitan areas of Mobile, Alabama and Pensacola, Florida. The Weeks Bay National Estuarine Research Reserve (here after referred to as the Reserve) contains 6,525 acres of land and water habitat which supports a wide variety of plant and animal species.

The Reserve can be characterized as representative of the greater Mobile Bay system and the Mississippi delta subcategory of the Louisiana biogeographic province. It is one of five Reserves in the Gulf of Mexico region. Habitats included in the Reserve are tidal wetlands and swamps, salt marshes, aquatic grass beds, maritime and palustrine upland forests, a pitcher plant bog and benthic estuarine sediments. It is an environment of great importance to the eastern Mobile Bay System, and possesses numerous species of plants and animals, including rare, threatened and endangered species such as the brown pelican eastern indigo snake, and Alabama red-bellied turtle. It is a highly productive area that serves as a nursery for commercially important shellfish and finfish, as well as a diverse array of other flora and fauna. Weeks Bay acts as a filter for pollutants, provides shoreline stabilization, and offers recreational and educational opportunities for the people of this coastal area.

Located in south Baldwin County 30 miles southeast of Mobile, the Reserve (Figure 6) is accessible by U.S. Highway 98 and County Roads 17, 27,and 1, as well as by boat. Bon Secour National Wildlife Refuge is located to the south of the Reserve. The Reserve includes five tracts of State-owned land: the Foley tract (178 acres) on the northeast side of Weeks Bay on the eastern shore of Fish River; the Ogburn tract (157 acres) directly south of the Foley parcel extending approximately to the mouth of

the Magnolia River; the Swift tract (615 acres) approximately 1.5 miles south of the mouth of Weeks Bay; and the Damson tract (360 acres) south of Highway 98 which extends along the western shore of Weeks Bay, and Viewpoint Park (2 acres) at the mouth of Weeks Bay.

A boundary expansion is herein documented that will include eight additional tracts acquired by the State of Alabama totaling 333 acres. These include the Fish River Marina tract (22 acres) at Fish River Bridge on U.S. Highway 98, Turkey Branch tract (20 acres) adjacent to and west of County Road 27, Harris tract (64 acres) and Worchester tract (49 acres), adjacent to each other located on Fish River, the Riverlands tract (90 acres) located south of Keeney Road, the Safe Harbor tract (81 acres) across U.S. Highway 98 from the Weeks Bay Interpretive Center, the Lott tract (3 acres) at the end of County Road 1, and the Meador tract (4 acres) at the County Road 32 bridge.

Every reserve is required by the Federal NERR regulations, 15 C.F.R. Part 921.13 to have an ERD-approved management plan that is updated every 5 years. A management plan is important for a variety of reasons: it provides a framework for the direction and timing of a Reserve's programs; it allows Reserve managers to assess how successfully a Reserve's goals have been met and to determine necessary changes in direction; and, it is used to guide Section 312 programmatic evaluations of the Reserve. The plan must describe the Reserve's goals, objectives, and management issues, and must identify the Reserve's intended strategies or actions for research, education/interpretation, public access, construction, acquisition, and resource preservation, restoration, and manipulation. Staff roles in each of these areas must also be addressed.

The Weeks Bay management plan provides a framework to guide the activities of the Reserve. The Reserve management goals and objectives are long-term. The management strategies used to achieve these goals are implemented in 2-5 year periods. Unanticipated changes in funding levels may require adjustments in the programs. Successful implementation of this plan depends substantially on the cooperation and coordination among the government agencies and the private sector. Roles and responsibilities for implementation are assigned to the key agencies and staff participating in the Reserve management.

Three goals have been established to guide management, program development, and implementation. They are to protect and improve habitat and biological diversity within the boundary of the Reserve, improve decisions affecting estuarine and coastal resources, and promote education, stewardship, and scientific research focusing on estuarine ecosystems.

The management plan was developed in accordance with NOAA regulations and follows the established NERR management plan structure and content. It is consistent with the Congressional intent of Section 315 of the Coastal Zone Management Act of 1972, as amended, and the provisions of the Alabama Coastal Area Management Program.

This plan establishes the programmatic goals of Weeks Bay Reserve consistent with the mission to provide leadership and promote informed management of coastal habitats. This is accomplished through facilitating scientific research, encouraging stewardship, and addressing the community needs of education and outreach. Through partnerships and staff activities exemplifying energy and enthusiasm, the Reserve will strive to accomplish the vision of promoting Weeks Bay as a healthy and flourishing estuary.

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I. INTRODUCTION

THE NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM:
CREATION OF THE NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

The Coastal Zone Management Act.

In 1972, Congress passed the Coastal Zone Management Act (CZMA). In the CZMA, and in subsequent re-authorizations, Congress officially recognizeds that resources of the coastal zone are of national significance, and are rapidly disappearing. The CZMA also recognizes the interrelationships between uplands and tidelands -- the "coastal zone" was defined in the Act as including all uplands "to the extent necessary to control shore lands."

Section 315 of the CZMA establishes the National Estuarine Research Reserve System (NERRS). Under the System, healthy estuarine ecosystems which typify different regions of the U.S. can be designated and managed as sites for long-term research, and used as a base for estuarine education and interpretation programs. The System also provides a framework through which management approaches, research results, and techniques for estuarine education and interpretation can be shared with other programs. The NERRS was established by the CZMA to help address the problem of current and potential degradation of coastal resources brought about by increasing and competing demands for these resources. Prior to establishment of the NERR system, the management of estuarine resources was inadequate, and scientific understanding of estuarine processes necessary for improving management was increasing slowly and without national coordination. There were no ready mechanisms to detect trends in estuarine conditions, or to provide information on these trends, the overall significance of estuaries, and possible solutions to the growing problems. The NERRS is one part of the solution for maintaining healthy coastal resources. NERRS research, education, and resource stewardship programs are tools that can help fill gaps in knowledge, and guide decision-making so that our estuaries can sustain multiple uses over the long term.

Section 302 of the CZMA states:

"The increasing and competing demands upon the lands and waters of our coastal zone have resulted in the loss of living marine resources, wildlife, nutrient-rich areas, permanent and adverse changes to ecological systems, decreasing open space for public use and shoreline erosion."

"The habitat areas of the coastal zone, and the fish, shellfish, other living marine resources, and wildlife therein, are ecologically fragile and consequently extremely vulnerable to destruction by man's alteration."

In recognition of these growing problems, section 303 of the CZMA establishes a national goal:

"...to preserve, protect, develop, and where possible, to restore and enhance the resources of the Nation's coastal zone for this and succeeding generations."

Section 302 of the CZMA also recognizes that coastal waters are significantly affected by land uses:

"Land uses in the coastal zone, and the uses of adjacent lands which drain into the coastal zone, may significantly affect the quality of coastal waters and habitats, and efforts to control coastal water pollution from land use activities must be improved."

Under the CZMA, participating coastal states receive grant money to develop and administer plans for coastal management. The CZMA also authorizes the provision of federal technical assistance to support state coastal zone management planning and plan implementation. A National Oceanic and

Atmospheric Administration (NOAA) approved coastal management plan gives states some control over federal actions affecting the state's coastal zone. Known as "federal consistency," this control includes actions proposed by a federal agency or which require federal approval, funding, or permits.

MISSION AND GOALS OF THE NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

The National Estuarine Research Reserve System (NERRS) was created by the CZMA of 1972, as amended, 16 U.S.C. Section 1461, to augment the Federal CZM Program. The reserve system is a network of protected areas established to promote informed management of the Nation's estuaries and coastal habitats. The reserve system currently consists of 27 reserves in 22 states and territories, protecting over one million acres of estuarine lands and waters. Under the system, healthy estuarine ecosystems which typify different regions of the U.S. can be designated and managed as sites for long-term research, and used as a base for estuarine education and interpretation programs. The NERRS was established to help address the problem of current and potential degradation of coastal resources brought about by increasing and competing demands for these resources. Prior to the establishment of the NERR system, the management of estuarine resources was inadequate, and scientific understanding of estuarine processes necessary for improving management was increasing slowly and without coordination.

Mission

As stated in the NERRS Strategic Plan 2005-2010, the mission of the National Estuarine Research Reserve System is

> "to practice and promote coastal and estuarine stewardship through innovative research and education, using a system of protected areas."

The goals established in the strategic plan are to:

1. Strengthen the protection and management of representative estuarine ecosystems to advance estuarine conservation, research and education.
2. Increase the use of reserve science and sites to address priority coastal management issues.
3. Enhance peoples' ability and willingness to make informed decisions and take responsible actions that affect coastal communities and ecosystems.

NERR System Administrative Framework

The Estuarine Reserves Division of the Office of Ocean and Coastal Resource Management (OCRM) administers the reserve system (Figure 1). The Division establishes standards for designating and operating reserves, provides support for reserve operations and system-wide programming, undertakes projects that benefit the reserve system, and integrates information from individual reserves to support decision-making at the national level. As required by Federal regulations, 15 C.F.R. Part 921.40, OCRM periodically evaluates reserves for compliance with Federal requirements and with the individual reserve's Federally-approved management plan.

The Estuarine Reserves Division currently provides support for three system-wide programs: the System-Wide Monitoring Program, the Graduate Research Fellowship Program, and the Coastal Training Program. They also provide support for reserve initiatives on restoration science, invasive species, K-12 education, and reserve specific initiatives and programs.

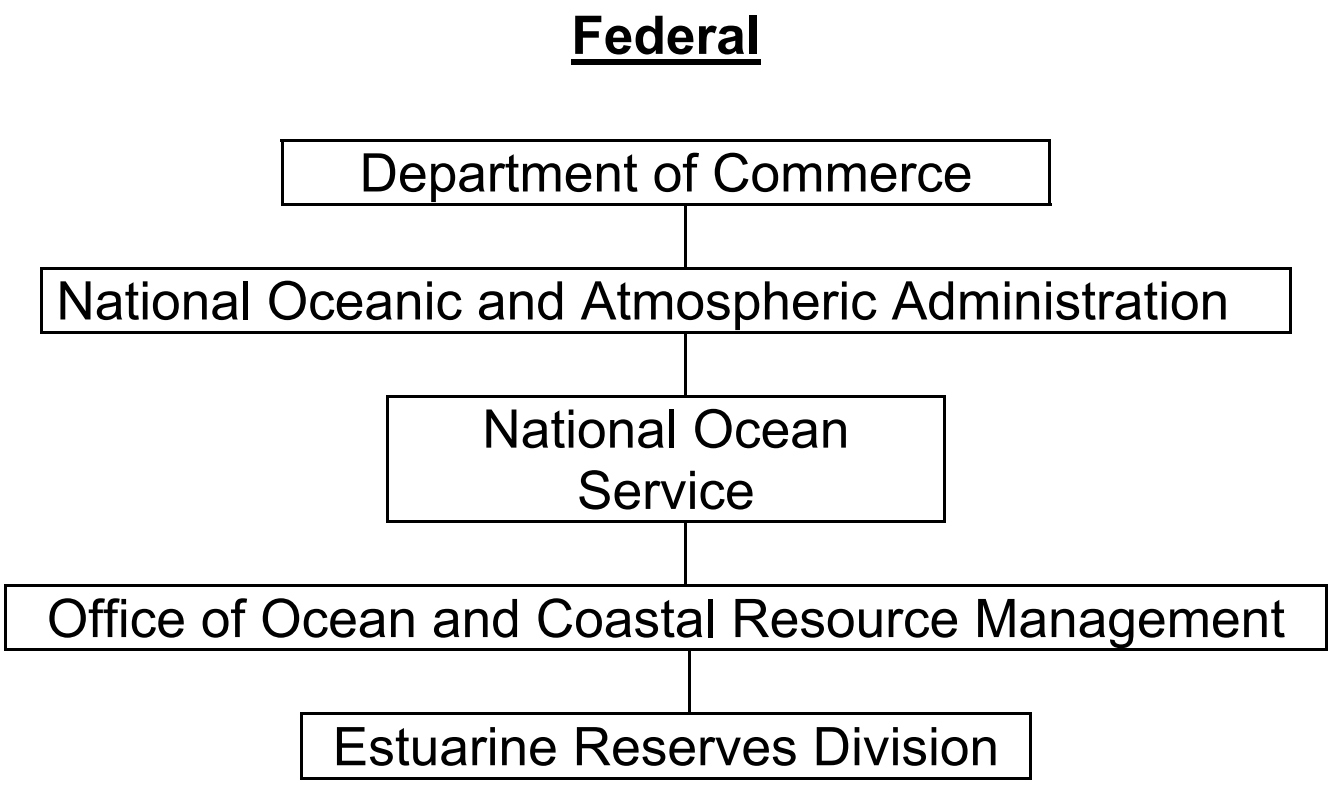

Figure 1: National Estuarine Research Reserve System Administrative Framework

Weeks Bay National Estuarine Research Reserve Administrative Framework

In February, 1986, Weeks Bay was officially designated as the nation's 16th National Estuarine Sanctuary. In April, 1986, concomitant with 1986 amendments, the name of the Sanctuary was changed to the Weeks Bay National Estuarine Research Reserve (WBNERR). The Alabama Department of Conservation and Natural Resources (ADCNR), State Lands Division (SLD), Coastal Section is the cooperating state agency and provides the administrative framework for operation of the Reserve (Figure 2).

BIOGEOGRAPHIC REGIONS

NOAA has identified eleven distinct biogeographic regions and 29 subregions in the U.S., each of which contains several types of estuarine ecosystems. When complete, the reserve system will contain examples of estuarine hydrologic and biological types characteristic of each biogeographic region. As of 2006, the NERR System contains twenty-seven reserves (Figure 3) and several states pursuing a designation.

Under Federal law (16 U.S.C. Section 1461), a state can nominate an estuarine ecosystem for Research Reserve status so long as the site meets the following conditions:

1) The area is representative of its biogeographic region, is suitable for long-term research and contributes to the biogeographical and typological balance of the System;
2) The law of the coastal State provides long-term protection for the proposed Reserve's resources to ensure a stable environment for research;
3) Designation of the site as a Reserve will serve to enhance public awareness and understanding of estuarine areas; and provide suitable opportunities for public education and interpretation; and
4) The coastal State has complied with the requirements of any regulations issued by the Secretary of Commerce.

Reserve boundaries must include an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation.

If the proposed site is accepted into the reserve system, it is eligible for NOAA financial assistance on a cost-share basis with the state. The state exercises administrative and management control, consistent with its obligations to NOAA, as outlined in a memorandum of understanding. A reserve may apply to NOAA's ERD for funds to help support operations, research, monitoring, education/interpretation, stewardship, development projects, facility construction, and land acquisition.

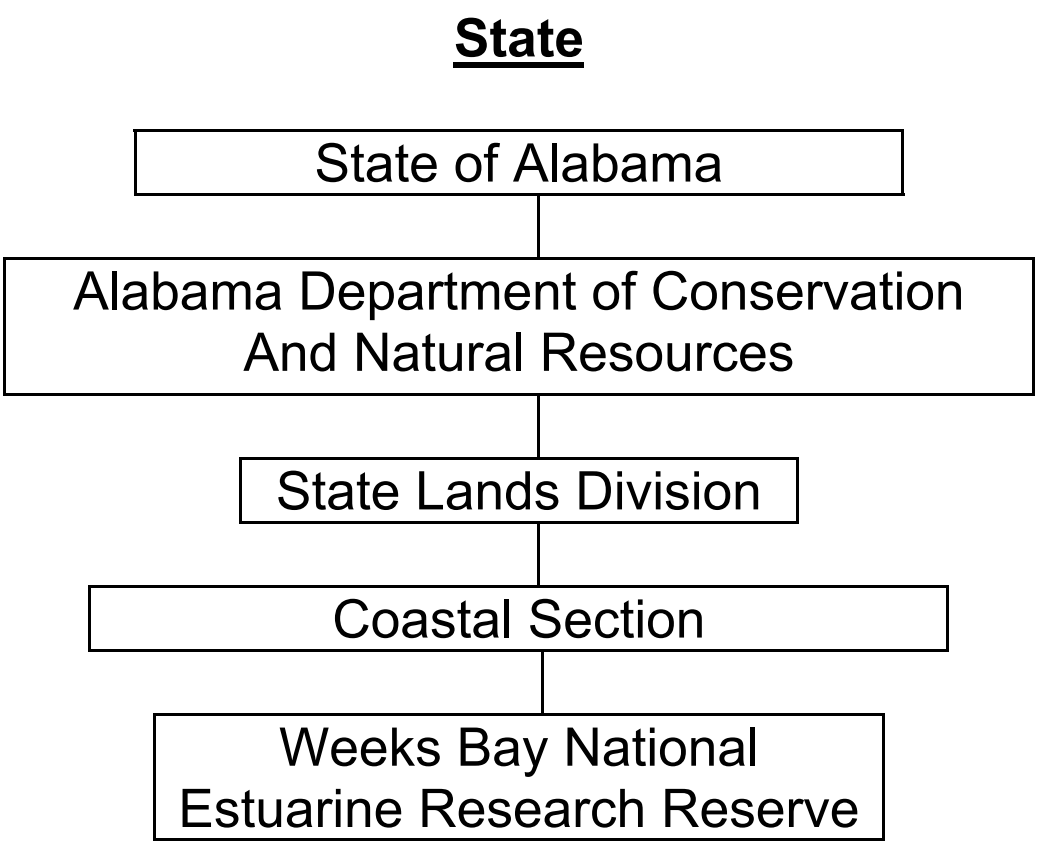

Figure 2: Weeks Bay National Estuarine Research Reserve System Administrative Framework

Figure 3. Designated and Proposed NERR Sites.

RESERVE MANAGEMENT PLANS

Every reserve is required by the Federal NERR regulations, 15 C.F.R. Part 921.13 to have an ERD-approved management plan that is updated every 5 years. A management plan is important for a variety of reasons:

- it provides a framework for the direction and timing of a Reserve's programs;
- it allows Reserve managers to assess how successfully a Reserve's goals have been met and to determine necessary changes in direction; and,
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The plan must describe the Reserve's goals, objectives, and management issues, and must identify the Reserve's intended strategies or actions for research, education/interpretation, public access, construction, acquisition, and resource preservation, restoration, and manipulation. Staff roles in each of these areas must also be addressed.

Development of and revisions to reserve management plans are subject to the National Environmental Policy Act (NEPA) because designation of and management changes in estuarine reserves are considered federal actions. NOAA has provided guidance to program offices on how to conduct the NEPA process for management plans. A Reserve's initial management plan, and any major proposed changes to a plan, are made available for public comment at national and local levels before receiving ERD's final approval.

WEEKS BAY RESERVE MANAGEMENT PLAN

The Weeks Bay Reserve Management plan describes the Reserve's goals, objectives, and management issues, and identifies intended strategies or actions for research, education/interpretation, public access, construction, acquisition, and resource preservation, restoration, and manipulation. Staff roles in each of these areas are also addressed. A proposed boundary expansion is described that includes additional lands under state management leading to greater conservation consistent with established goals of the National Estuarine Research Reserve System as established in Federal Register 15 CFR Part 921.1(b).

THE WEEKS BAY NERR: SETTING

Weeks Bay is an estuarine system, located along the eastern shore of Mobile Bay in Baldwin County between the major metropolitan areas of Mobile, Alabama and Pensacola, Florida (Figure 4). The Weeks Bay National Estuarine Research Reserve (here after referred to as the Reserve) contains 6,525 acres of land and water habitat which supports a wide variety of plant and animal species.

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Located in south Baldwin County 30 miles southeast of Mobile, the Reserve is accessible by U.S. Highway 98 and County Roads 17, 27,and 1, as well as by boat (Figure 5). Bon Secour National Wildlife Refuge is located to the south of the Reserve. The Reserve includes five tracts of State-owned land (Figure 6): the Foley tract (178 acres) on the northeast side of Weeks Bay on the eastern shore of Fish River; the Ogburn tract (157 acres) directly south of the Foley parcel extending approximately to the mouth of the Magnolia River; the Swift tract (615 acres) approximately 1.5 miles south of the mouth of Weeks Bay; and the Damson tract (360 acres) south of Highway 98 which extends along the western shore of Weeks Bay, and Viewpoint Park (2 acres) at the mouth of Weeks Bay.

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This Boundary expansion supports the goals of the NERRS as established in the Federal Register 15 CFR part 921.1(b). This states that Reserves will promote long-term protection of estuaries, address management issues, and encourage stewardship, research, and education. The boundary expansion will offer greater protection of the Weeks Bay estuarine system and promote conservation of coastal resources. Expansion of the Reserve boundary will offer greater protection to the coastal area. Greater protection and management of these expanded areas will protect and improve habitat resulting in conservation of biological diversity. Management of these areas will also facilitate research through the protection offered by being within the Reserve boundary. Education and Stewardship will also benefit from the boundary expansion as these protected areas can more easily be incorporated into various projects.

Weeks Bay Core and Buffer Area

The Weeks Bay Reserve establishes those areas dedicated to education, research and resource protection and subject to the policies, management strategies and rules of the Reserve as set forth in the Management Plan and as agreed upon by ADCNR, ADEM, and other applicable agencies. The water bottoms within the Reserve, up to mean high tide, are considered to be the core areas of critical

habitat where no disturbance should occur that would affect the integrity of that area. Any property owners who seek to build piers must build according to the pier criteria. Expanded core includes: 1) the water bottoms of Fish and Magnolia Rivers, and their tributaries, to the mean high tide line and to the termination of tidal influence, and 2) the water bottoms of Bon Secour Bay adjacent to the Swift tract and north across the mouth of Weeks Bay to the mean high tide line. All other lands within the Reserve boundary should serve as a buffer to protect the core and provide additional protection for estuarine-dependent species (Figure 6).

Weeks Bay Coastal Area

The Alabama coastal area as delineated in the Alabama Coastal Area Management Plan (ACAMP) established under the Coastal Zone Act of 1972, as amended, consists of that land seaward of the continuous ten (10) foot contour to the limits of the State's territorial waters. Accordingly, the Weeks Bay Coastal Area is delineated as that portion of the Alabama coastal area surrounding Weeks Bay extending from the mouth of the Bon Secour River to Mullet Point Park at the intersection of U.S. Highway 98 and County Road 1 (Figure 7). This delineation will provide for consistency of interaction between the Alabama Coastal Area Management Program as administered by ADCNR ADEM and the Reserve. Within the Weeks Bay Coastal Area the highest priority exists for land acquisition and for resource protection activities. In the Weeks Bay Coastal Area, every effort will be made to develop cooperative management strategies with state and local agencies and with local government. The majority of the Reserve boundary falls within the Weeks Bay Coastal Area (Figure 7).

The Weeks Bay Coastal Area as delineated above is designated a Geographic Area of Particular Concern (GAPC) in the Alabama Coastal Area Management Plan (ACAMP).

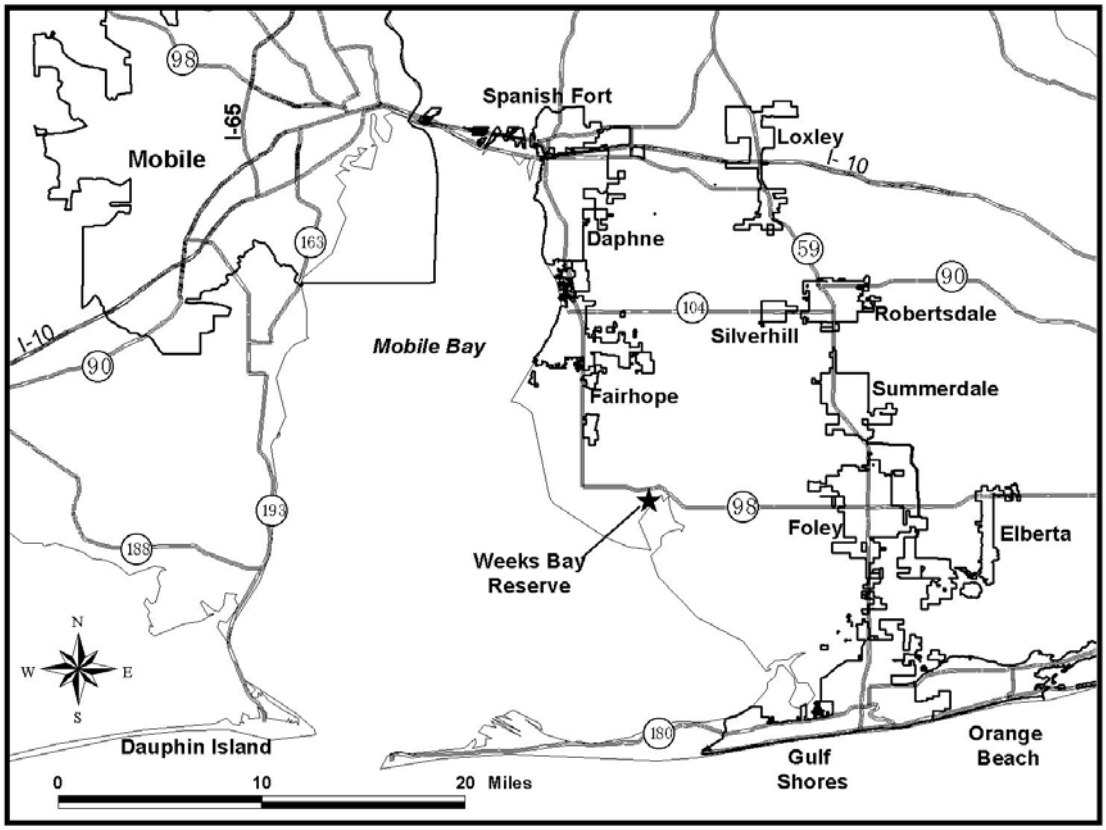

Figure 4. Mobile Bay System.

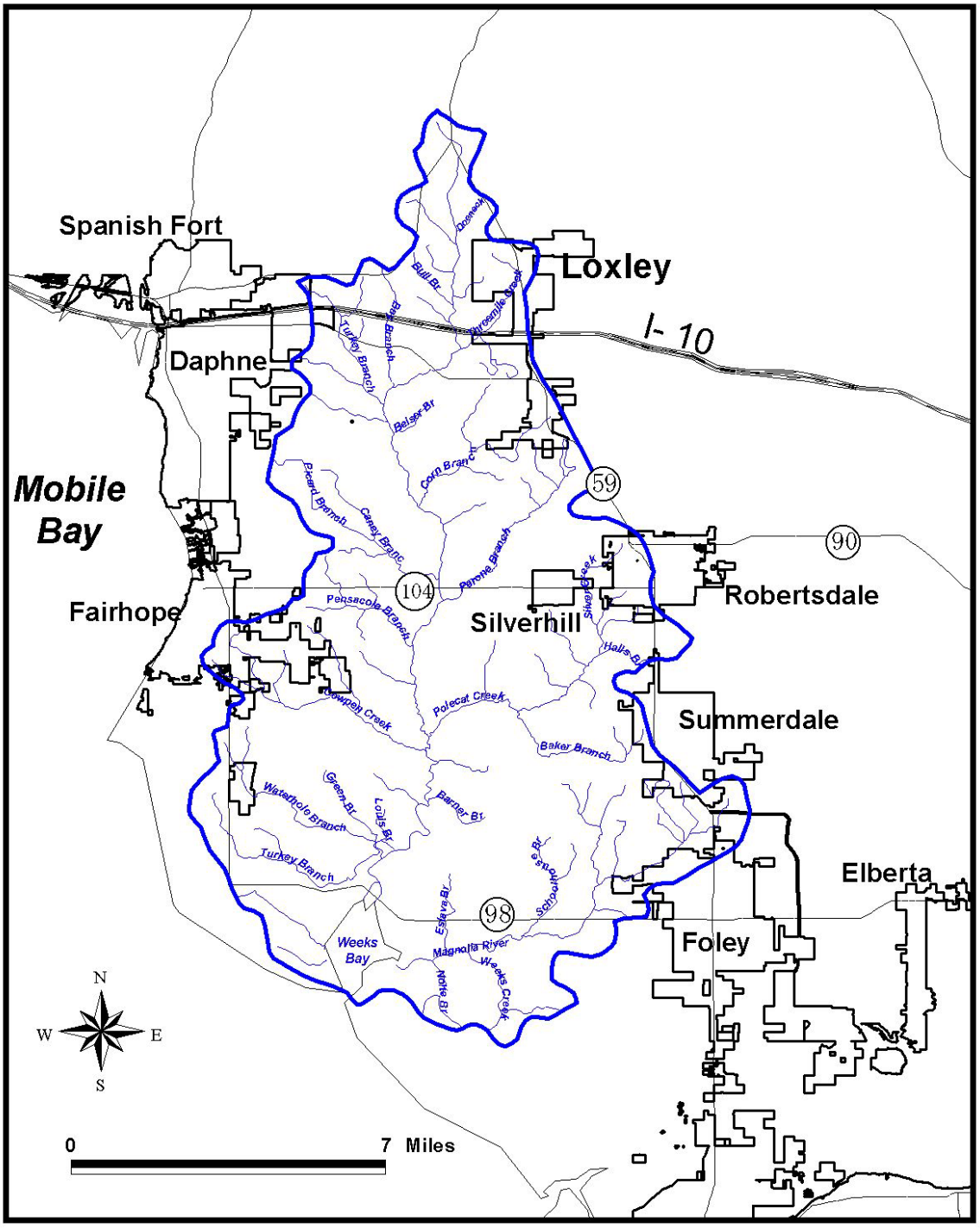

Figure 5. Weeks Bay Watershed and Access

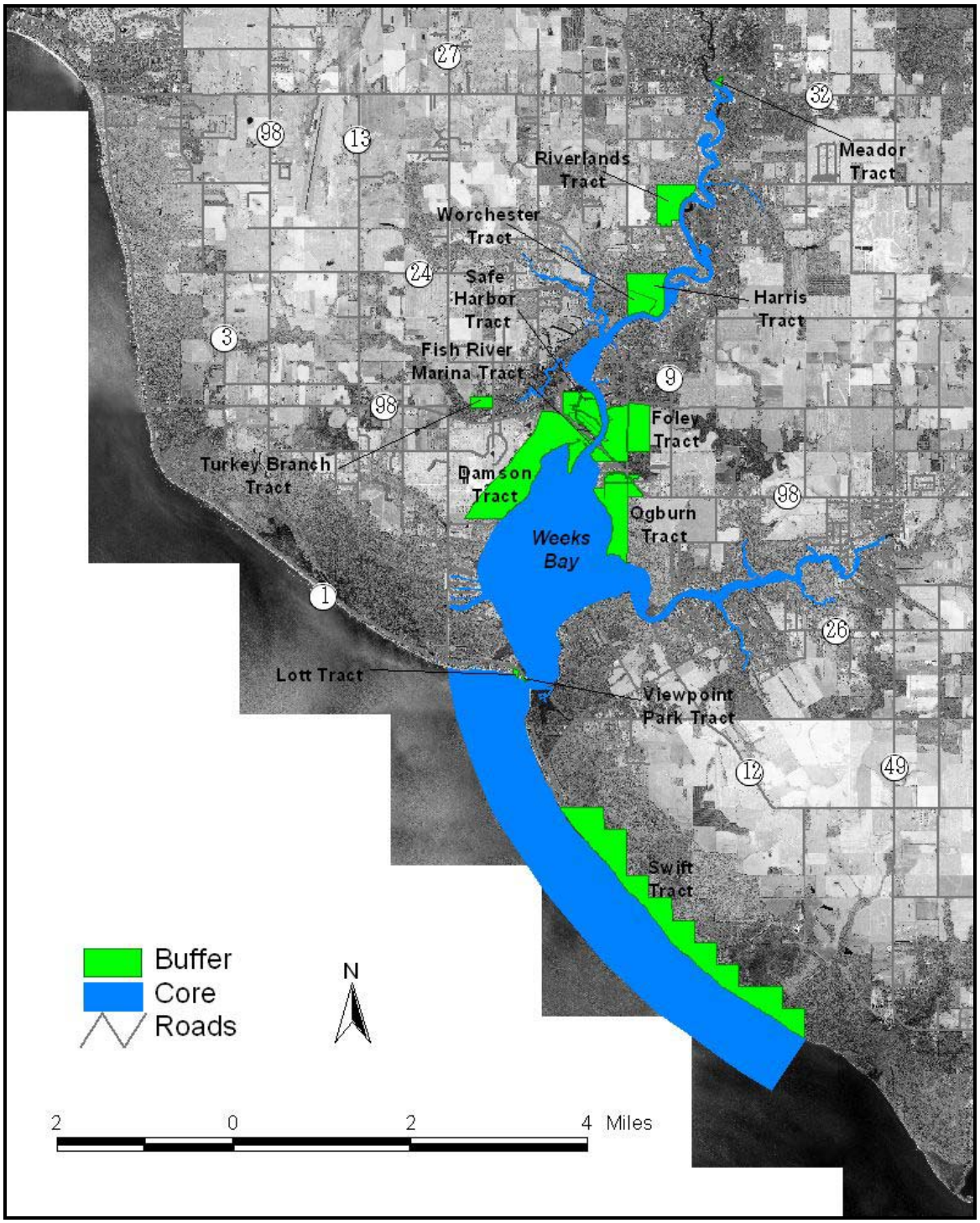

Figure 6. Expanded Reserve Boundary

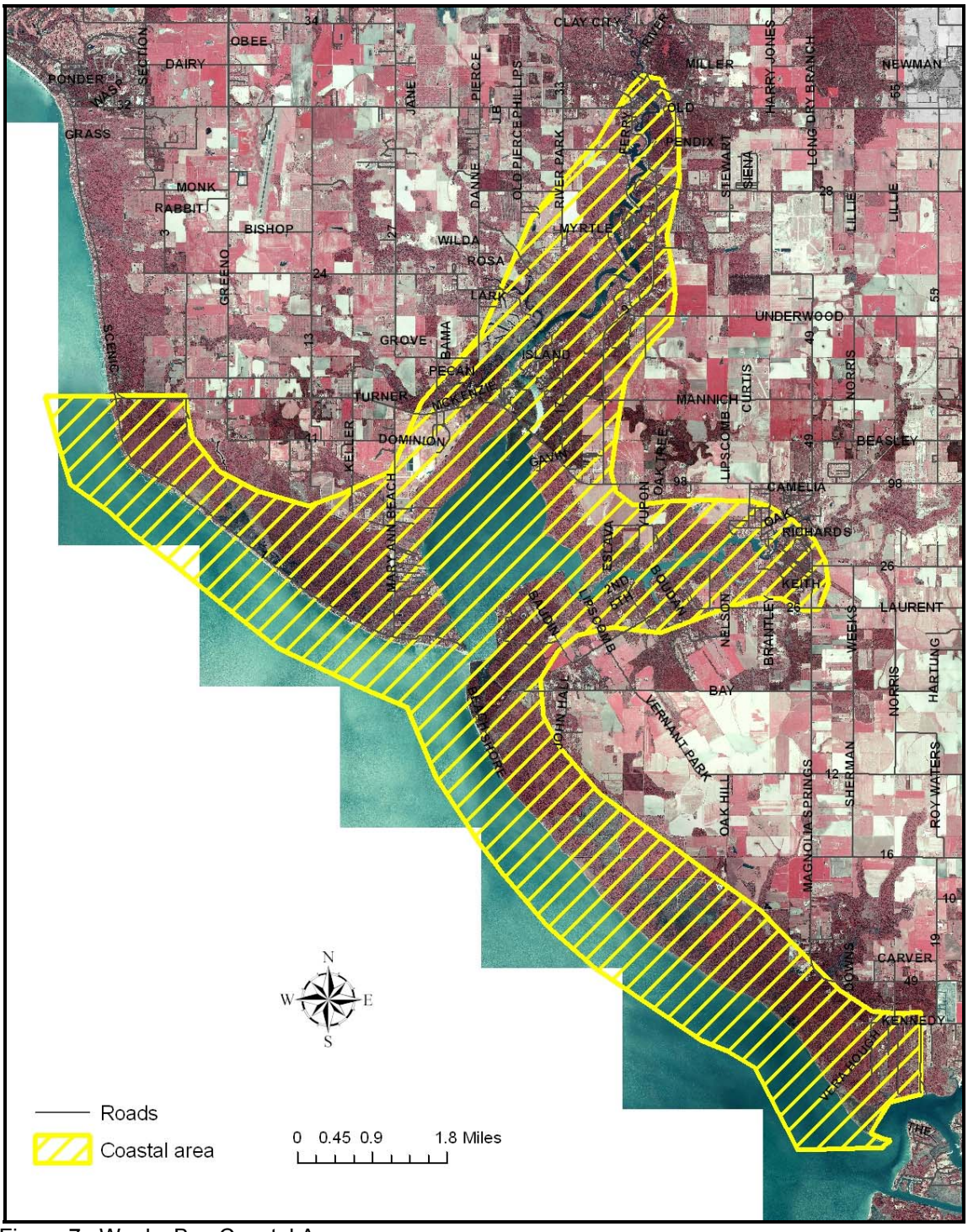

Figure 7. Weeks Bay Coastal Area

Physical Aspects

General Physiography

Coastal Alabama lies within parts of two major physiographical provinces; the East Gulf Coastal Plain section of the Coastal Plain province, and the Mississippi-Alabama shelf section of the Continental Shelf province. Land areas in coastal Alabama are within the Southern Pine Hills and the Coastal Lowlands subdivisions of the East Gulf Coastal Plain section.

The Coastal Lowlands are an essentially flat to gently undulating plain extending along the coast adjacent to the Mississippi Sound and along the margins of Mobile, Bon Secour, and Perdido Bays. The lowlands are indented by many tidal creeks, rivers, and estuaries fringed by tidal marshes which are subject to inundation at high tide.

Climate

The Reserve lies in the humid sub-tropical climate region (Trewartha and Horn 1980), a climate that dominates the Gulf Coast states and Florida Peninsula. Summers are characteristically warm while winters are relatively mild with occasional cold waves. In the contiguous United States, this region is second only to the Pacific Northwest in total annual rainfall (Baldwin 1973), receiving precipitation from a combination of winter storms, thunderstorms and tropical systems with an average accumulation of 65 inches.

Geology

The Reserve lies in the Southern Pine Hills subdivision of the Gulf Coastal Plain physiographic province (Chermock et al. 1974). Sediments in this region are composed of quartz-rich sand interlayered with clays and silts. The Weeks Bay embayment was believed to have been formed at least 11,000 years ago during the Pleistocene Epoch (Smith 1986). Benthic sediments within Weeks Bay are a combination of silts and clays found throughout most of the interior of the bay and relatively clean quartz sands found in three areas of the bay system (Haywick et al. 1994). The source of the silt and clay material, as well as the sand is principally from the Fish and Magnolia Rivers. However, the sands around the periphery of the bay are mostly the result of erosional processes along the shoreline. The sands in the vicinity of the inlet at the mouth of the bay are likely derived from bedload inputs from the rivers, shoreline erosion within the bay and material transported into Weeks Bay from Mobile Bay.

Habitats

Forested Wetlands and Swamp Habitats

Much of the land around Weeks Bay is forested wetlands and swamps. For example, the Foley and Ogburn Tracts and part of the Swift Tract are primarily comprised of a forested wetland type known as moist pine forest (Figure 8). The moist pine line is prevalent in areas of low relief and poor drainage between streams. It forms a more or less extensive strip between flood plain swamps and upland pine-oak forest. Despite its apparent monotony, the vegetation of moist pinelands is diverse and rich in species. The common trees are slash pine (*Pinus elliotti*), and sweet bay (*Magnolia virginiana)* although longleaf pine (*Pinus palustris*) also grows there. The understory may be very dense, consisting largely of gallberry (*Ilex glabra*), wax myrtle (*Myrica cerifera*), saw palmetto (*Serenoa repens*), St. John's-wort,

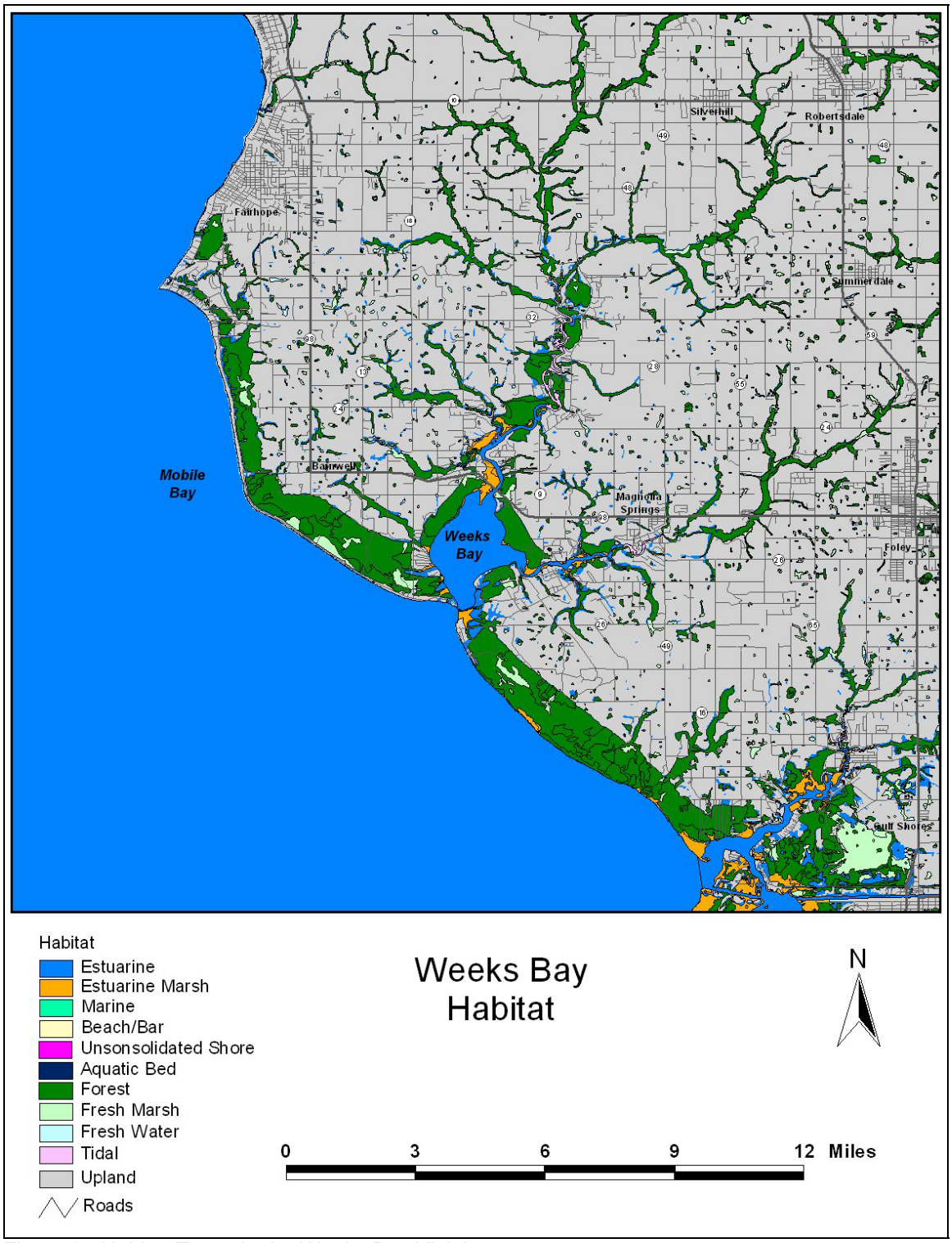

Figure 8. Habitat Types in the Weeks Bay Vicinity

Hypericum fasciculatum and sweet bay (*Magnolia virginiana*),wamp bay (*Persea palustris*), and swamp tupelo (*Nyssa sylvatica* var. *biflora*).

The Fish River, Magnolia River, and several small tidal streams in the Weeks Bay area are bordered by a forested wetland type known as bay, tupelo, and cypress swamp. The vegetation of these swamps varies depending partly on the amount and duration of flooding. If flooding is extensive, pond cypress (*Taxodium distichum nutans*) and swamp tupelo may dominate the canopy. Usually under moderate flooding the dominant tree is sweet bay. Red maple (*Acer rubrum*), swamp tupelo, swamp bay and tulip tree (*Liriodendron tulipifera*) may also occur there. White cedar (*Chamaecyparis thyoides*) becomes increasingly more common in swamps along upper reaches of streams, especially along the Fish and Magnolia Rivers.

Few plants grow under the dense shade of such trees. Among these trees are shrubs such as Virginia willow (*Itea virginica*), star anis (*Illicium floridanum*), and fetterbush (*Leucothoe axillaris*). Netted chain fern (*Woodwardia areolata*), and cinnamon fern (*Osmunda cinnamonea*) are among the few tolerant herbs growing there.

The more open borders of these swampy woods may be covered by dense thickets of swamp cyrilla (*Cyrilla racemifora*), black titi (*Cliftonia monophylla*), and large gallberry (*Ilex coriacea*). Wax myrtle (*Myrica cerifera*) and yaupon (*Ilex vomitoria*) also grow in this habitat and are especially common along the brackish waters of Weeks Bay and on the Swift Tract.

The transition zone between these forested wetlands and upland pine-oak forests may support growth of plants adapted to somewhat better drained condition such as water oak (*Quercus nigra*), laurel oak (*Quercus laurifolia*), sweet gum (*Liquidambar styraciflua*), southern magnolia (*Magnolia grandiflora*), and devilwood (*Osmanthus americana*).

Marshes

The shoreline of Weeks Bay supports marshes dominated by salt-tolerant herbs and grasslike plants. These marshes occur as narrow shoreline fringes and extend up the tidal mouths of the Fish and Magnolia Rivers. The needle rush (*Juncus roemerianus*) is an abundant species, and dominates portions of marsh in the area.

Two species of cordgrass (*Spartina alterniflora* and *S. cynosuroides*) are locally abundant in the intertidal zone. Other common species are salt grass (*Distichlis spicata*), saltmeadow cordgrass (*Spartina patens*), salt marsh aster (*Aster tenuifolius*), marsh gerardia (*Agalinis maritima*), and sea lavender (*Limonium nashii*).

Within the less saline, brackish marshes, a greater diversity of species occurs. Of the saline marsh species, only needle rush and saltmeadow cordgrass are found frequently in the brackish environment. Common brackish species include cattails (*Typha* spp.), spike rush (*Eleocharis* spp.), reed (*Phragmites australis*), bull rushes (*Scirpu*s spp.), and sawgrass (*Cladium jamaicense*).

Submerged Aquatic Vegetation (SAV)

Four species of plants dominate the submerged grassbeds in Weeks Bay. The most abundant species is widgeon grass (*Rupia maritima*). The other species are Eurasian watermilfoil (*Myriophyllum spicatum*), tapegrass (*Vallisneria americana*), and slender pondweed (*Potamogeton pusillus*). The occurrence of these grass beds is restricted to relatively quiet waters along shorelines.

Due to high turbidity conditions and subsequent reduction of available light, beds occur only in shallow waters less than two meters deep, most in less than one-half meter.

Invasive Species

A number of non-native invasive species are present in the Reserve and pose a significant threat to the integrity and community structure of Reserve habitats. Terrestrial species observed are

Sapium sebiferum – Popcorn or Tallow tree
Imperata cylindrical – cogon grass
Lygodium japonicum- Japanese Climbing Fern
Cinnamomum camphora – Camphor
Colocasias sp. – Elephant ear
Dioscorea bulbifera – Air potato
Pueraria Montana – Kudzu
Ligustrum sinense – Chinese privet

Aquatic species observed are

Eichhornia sp. – Water hyacinth
Salvinia minima – Water fern
Pistia stratiotes – Water lettuce
Panicum repens L. – Torpedo grass (can also occur on land)
Alternanthera philoxeroides – Alligator weed (can also occur on land)
Myocaster Coypus – Nutria

The sub-aquatic species *Hydrilla verticillata* has been observed in Barner Branch and efforts to control its proliferation are ongoing. Additionally, within a sixty acre tract that encompasses the nature trail, control efforts have successfully reduced the presence of a variety of terrestrial invasive species. Plans are in place to map exotic invasive flora species within the watershed for management purposes.

Hydrilla (*Hydrilla verticillata*) or water thyme in Barner Branch

Hydrilla is a submerged aquatic perennials and is viable under a variety of environmental conditions. Stems typically grow rooted in the bottom substrate, but fragment easily into free-floating pieces that root at nodes. Fragments may start new colonies when carried elsewhere. Hydrilla can aggressively invade new aquatic environments, displace native aquatic vegetation by forming dense stands or large sub-surface mats, and alter the dynamics of aquatic ecosystems. Other detrimental impacts from heavy infestations can include water flow impediment in waterways, increased flooding, clogged pumps and boat propellers, diminished water clarity, reduced use of waterways for recreational activities, and economic loss.

The Watershed

The Alabama coastal area has some 400,000 acres of bay and estuarine waters, 121,000 acres of vegetated wetlands, 330 identified species of birds, a commercial fishing catch with a value exceeding $148 million, and a registration of over 23,300 recreational boats.

Within the coastal area, the Weeks Bay watershed encompasses about 149,000 acres in Baldwin County. Parts of the city limits of Fairhope, Robertsdale, Foley and Loxley are located in the area (Figure 5). According to the U.S. Census 2000, these towns have populations of 12,480; 3,782; 7,590; and 1,348, respectively. Activities such as fishing, boating, crabbing, hunting, and wildlife photography/observation are common in Weeks Bay. The watershed is primarily rural, but it is within commuting distance from the cities of Mobile and Pensacola. As a result, a substantial increase in residential and commercial development within the watershed continues to occur, especially along the Eastern Shore, adjacent to Highway 98 and on the outskirts of the city of Foley.

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Impacts to Weeks Bay

The history of Weeks Bay has its beginning with American Indians. Indian tribes dwelling in southwest Alabama lived around the bay. The area remained relatively unspoiled for years but the recent push for coastal development has led to a need for preservation.

Impacts on the Alabama coastal environment include:

- Point Source Pollution – Major industrial and municipal sources discharging 170 million gallons of various waste products each day into coastal waters.
- Coastal Development – a booming second home construction business throughout the area's waterfront.
- Dredging – a maintenance dredging requirement producing 7million cubic yards of spoil materials annually.
- Energy Development – prospect of increased oil and gas development in the area of Weeks Bay.
- Population Growth and Associated Development - Mobile and Baldwin Counties are both experiencing rapid population increases as well as urban growth. Baldwin County, recently identified one of the fastest growing county in the state of Alabama, had an overall population increase of 43% during the period of 1990-2000. This population explosion can detrimentally affect Weeks Bay and the Reserve. According to a Remote Sensing and GIS analysis of landuse/landcover in the Weeks Bay watershed performed by Cartwright (Cartwright, 2002), there have been significant increases in land use in the watershed. Table 1 shows a summary of landuse and landcover and the amount of change between 1990 and 2000. One of the most dramatic changes can be seen in the Urban/Built-Up classification. Cartwright's research showed that the amount of urban or developed land in the watershed increased by 92.47% during the study period.

	1900		2000		
Classification	**Percent of Watershed**	**Acres**	**Percent of Watershed**	**Acres**	**Percent Change**
Water	1.84%	2,302	1.89%	2,365	2.74%
Forested Vegetation	33.12%	16,781	31.49%	39,431	-4.91%
Herbaceous Vegetation	28.94%	14,664	21.00%	26,292	-27.44%
Seasonal Herbaceous Vegetation	19.72%	9,994	23.20%	29,043	17.60%
Transitional/Mixed Vegetation	7.08%	3,587	12.22%	15,296	72.56%
Urban/Built-Up	1.34%	679	2.58%	3,228	92.47%
Sparse/Built-Up	7.96%	4,034	7.63%	9,557	-4.13%

Table 1. Changes in Land Use and Land Cover between 1990 and 2000
Source: (Cartwright, 2002).

MISSION AND GOALS OF THE WEEKS BAY NERR

MISSION

Weeks Bay National Estuarine Research Reserve mission is to:

Provide leadership to promote informed management of estuarine and coastal habitats through scientific understanding, and encourage good stewardship practices through partnerships, public education, and outreach programs.

This management plan provides a framework to guide the activities of the Reserve. The Reserve management goals and objectives are long-term. The management strategies used to achieve these goals are implemented in 2-5 year periods. Unanticipated changes in funding levels may require adjustments in the programs. Successful implementation of this plan depends substantially on the cooperation and coordination among the government agencies and the private sector. Roles and responsibilities for implementation are assigned to the key agencies and staff participating in the Reserve management.

WEEKS BAY NERR GOALS AND OBJECTIVES:

Three goals have been established to guide management, program development, and implementation. They are to:

- Protect and improve habitat and biological diversity within the boundary of the Reserve.
- Improve decisions affecting estuarine and coastal resources.
- Promote education, stewardship, and scientific research focusing on estuarine ecosystems.

The following tables outline the objectives developed by each program to support the goals of the Reserve. Action plans are described in more detail in the sections of the plan that pertain to each program.

Mission **Provide leadership to promote informed management of estuarine and coastal habitats through scientific understanding and encourage good stewardship practices through partnerships, public education, and outreach programs.**				
Vision **Promote a healthy flourishing Weeks Bay**				
Goals		**Protect and improve habitat and biological diversity within the boundary of the Reserve.**	**Improve decisions affecting estuarine and coastal resources.**	**Promote education, stewardship, and scientific research focusing on estuarine ecosystems.**
Objectives	Administration	Solicit and obtain funds to support habitat and biological diversity.		Facilitate administrative and financial management of Reserve research, education, and outreach programs.
				Provide administrative staffing and facilities to support Reserve programs.
				Improve and enhance partnerships to benefit Reserve programs.
	Stewardship	The Reserve will manage natural resources to maintain and restore ecosystem function.	Research and monitoring data will become the basis for better informed coastal management decisions.	Improve exhibits and outreach initiatives to support Reserve programs.
		Restore and protect habitat, through land acquisition, education, and incentive programs.		Provide for long-term support and involvement of watershed residents in watershed planning and management activities.

Table 2. Goals and Objectives by Program

Goals		**Protect and improve habitat and biological diversity within the boundary of the Reserve.**	**Improve decisions affecting estuarine and coastal resources.**	**Promote education, stewardship, and scientific research focusing on estuarine ecosystems.**
Objectives	Boundary & Acquisition	Prioritize habitat areas and land tracts for acquisition within the Weeks Bay Coastal Area according to their contributions to ecosystem function.		
		Develop land acquisition methods and conservation initiatives to protect ecologically valuable habitats and expand the Reserve boundaries.		
	Public Access	Designate areas and guidelines for public access to reduce impact on resources and maximize public outreach.		Improve and enhance water access to facilitate Reserve programs.

Table 2. Goals and Objectives by Program

Goals		**Protect and improve habitat and biological diversity within the boundary of the Reserve.**	**Improve decisions affecting estuarine and coastal resources.**	**Promote education, stewardship, and scientific research focusing on estuarine ecosystems.**
Objectives	Facilities and Construction			Develop buildings and boardwalks that have a low impact on natural resources within the Reserve.
				Existing resources will be improved and enhanced to better accommodate Reserve programs.
	Research and Monitoring		Make baseline data on habitats and water quality available to local, state, and national entities.	Provide resources support, and background data to independent research projects within the Reserve and adjacent associated waters.
			Monitoring and research data will be translated and disseminated to local, state, and federal partners and other private and public users through education and outreach programs.	Increase understanding of watershed functions and methods of resource protection and restoration through applied research and monitoring projects.

Table 2. Goals and Objectives by Program

Goals		**Protect and improve habitat and biological diversity within the boundary of the Reserve.**	**Improve decisions affecting estuarine and coastal resources.**	**Promote education, stewardship, and scientific research focusing on estuarine ecosystems.**
Objectives	Education	Provide resources to maintain, develop and implement educational programs.	Use the training, and outreach center for the capacity building of coastal resource managers.	Develop and implement comprehensive education and interpretation programs to increase knowledge of target audiences.
				Develop needs assessment and evaluation tools to measure effectiveness of education programs.
	Volunteers		Trained volunteers will transfer knowledge and enthusiasm to wider audiences.	The Reserve will utilize volunteers to enhance and expand programs.
				Provide opportunities for volunteers to be involved with education, stewardship, and research programs.

Table 2. Goals and Objectives by Program

Integrating Research, Stewardship, and Education Activities through Partnerships

Reserve staff will interact with the community and local agencies to coordinate efforts to make informed decisions in the area of resource management. Issues such as U.S. Army Corps of Engineers (COE) permits, rezoning, hazardous materials, sediment and erosion control, septic treatment, habitat modification and restoration, and water quality will be reviewed and relevant information disseminated to the public. Information obtained through research and monitoring activities will be made available to the public via a variety of transfer mechanisms. The Reserve will promote stewardship based on scientific information and expressed as an integration of research and education. The Reserve will continue to strive for resource protection and promote stewardship through an integration of research and education by:

- Cooperating with various agencies and institutions to positively impact and support the coastal resources of Alabama
- Partnering with other similar projects to respond to informational needs of decision makers and coastal managers
- Evaluating COE permits stating the effect on the Reserve and making comments when appropriate
- Managing Reserve properties to restore and maintain natural habitats
- Providing educational exhibits which reflect current scientific information on the estuarine environment
- Promoting Best Management Practices (BMP) for various land use activities through brochures, pamphlets, displays, demonstration projects, and workshops
- Continuing to schedule workshop topics which are responsive to educators, decision makers, technical professionals, and the interested public at large
- Evaluating methods and techniques used to insure short and long term goals are met
- Utilizing the Coastal Training Program (CTP) for information transfer to promote best management decisions to conserve resources

The Reserve will continue to interpret scientific information and present it to the public in a usable format. The Weeks Bay Advisory Committee (WBAC) will provide input and guidance on relevant issues of concern. This advisory committee will meet on a quarterly basis and will give valuable input on the development of major projects. The committee will assist the Reserve staff on technical topics and will make recommendations when need be. As the need arises, the WBAC will establish sub-committees to evaluate these issues, projects, and topics. For example, subcommittees have previously been formed to address issues concerning research and education.

Linkages between Coastal Zone Management (CZM) and NERRS, transfer of Information to Coastal Decision Makers

1. The Reserve and Alabama CZM Program coordinate and support each other. Coordination is assured by several means:

    a. The Reserve Manager reports to the CZM Program Manager who is also the Coastal Section Chief of the Lands Division, ADCNR.

    b. The Reserve is represented on the CZM Technical Interagency Committee (TIC).

    c. The CZM Program is represented on the Weeks Bay Advisory Committee.

d. The Reserve Manager and the CZM Program Manager and staffs interact regularly in the coastal area and with the Lands Division Director and staff in Montgomery to coordinate and support conservation efforts.

e. The CTP will be used as a common ground for discussion and transfer of information useful to coastal decision makers.

2. The CZM Program supports the Reserve through funding, program policy, and regulations:

a. Where funds are available and their use not prohibited by federal or state guidelines, the CZM Program supports the activities of the Reserve financially. An example is the funding of the Pitcher Plant Bog Boardwalk with CZM Section 306 (a) funds in FY96/97.

b) Program policy of the CZM Program recognizes and reinforces the goals of the Reserve. A current example is the designation of the Reserve as an Area for Preservation and Restoration (APR) in the revision of the Alabama Coastal Area Management Plan (ACAMP).

c) The regulations of the Alabama CZM Program as promulgated by the Alabama Department of Environmental Management (ADEM) - the regulatory arm of the Alabama CZM Program - promote the resource protection program of the Reserve wherever feasible. ADEM has worked with the Reserve to develop pier criteria for Weeks Bay and may encompass these criteria in their coastal program regulations (ADEM Administration Code R. 335-8-1)

3. The Reserve has a leading role and supports the CZM Program through public education and research.

a) A large portion of the public education/outreach needs of the Alabama CZM Program, particularly that directed toward the age groups K-12, are met by the programs of the Reserve. Recognition of this and closer coordination of education/outreach activities is a priority of both programs. The CTP will offer many opportunities for strengthening this coordination.

b) As the research tracking and coordination capabilities of the Reserve increase, there will be a greater opportunity for the Reserve to offer assistance to the CZM Program. In this capacity the Reserve, in consultation with the CZM Program, could facilitate research useful to both programs and to the wider coastal resource management effort.

II. ACCOMPLISHMENTS

OVERVIEW

Since initiation of the first Management Plan in 1986, the Reserve met many milestones. Most important is the completed construction of a 4,000 square ft. Interpretive Center. This building serves to house the Reserve Staff, Library and research collections as well as the Interpretive and Educational Facilities. In 1997, final construction of a 3100 square ft. Research and Educational Facility was completed. This new building has expanded educational capabilities by incorporating a 54-person auditorium as well as expanded office and exhibit areas. This building serves as the new Research facility. It includes both office and laboratory space for resident researchers and also provides housing, and laboratory facilities for visiting faculty and students. In 2003, an addition to the laboratory was completed that more than doubled laboratory space.

In 1997, the Kurt G. Wintermeyer Trail and a current maintenance building were completed. In addition to housing maintenance personnel and equipment, it also serves as a construction and repair shop. Other visitor facilities completed in recent years include 2000 foot elevated boardwalk and observation deck with an additional 1200 foot extension, a fishing pier/park which provides public access to the bay, and development and improvement of two miles of hiking trails. In addition to facilities improvements, the Reserve purchased a 32 foot pontoon boat for research and educational programs and an 18 foot skiff for research and monitoring activities.

During 1997, two properties were secured for conservation, 1) the marina property at the mouth of Fish River consisting of 22 acres, and 2) 82 acres of land was acquired for resource protection, harboring of research vessels, and public water access. The Weeks Bay Reserve Foundation was instrumental in securing these properties.

In 1992, Weeks Bay was designated as an Outstanding National Resource Water by the Alabama Department of Environmental Management (ADEM). This designation aided in the establishment at the Reserve of the Weeks Bay Watershed Project (WBWP) in 1994 with §319 Nonpoint Source Pollution (NPS) funds from the US Environmental Protection Agency (EPA) and cooperation of local agencies and stakeholders. With WBWP, the Reserve partnered with many other local agencies, businesses, and watershed residents to produce successful workshops, presentations, and other educational programs. The underlying message in each of these programs is the improvement of water quality through voluntary measures. Associated with the Reserve is a dedicated group of volunteers who participate in the Alabama Water Watch Monitoring Program (AWW). They have received many awards from the AWW program, People Against a Littered State (PALS), and the Adopt-a-Stream program.

In addition to creation of six permanent staff positions at the Reserve in the past ten years, the Volunteer Program has grown to over 100 participants, donating over 5000 hours of time per year. As development of this program continues, it is expected that this number will increase as the program and the Reserve continue to offer public awareness and involvement possibilities. The Volunteer Program holds an annual native plant sale to encourage the public to landscape with local flora and teach how to best attract rare faunal species. Through both staff and volunteer assistance, the Reserve has also hosted television programs for children, acquired and now maintains large specimen collections of fauna and flora of the region, completed several live animal exhibits and produced numerous brochures on flora, fauna, and a variety of resources and management practices within the Reserve and surrounding habitats. The Weeks Bay Volunteer By-Laws are included in Appendix A.

The Reserve provides library services to the general public and researchers. Numerous educational, outreach programs and guided nature tours have been developed. The increase in public access to the resources available at the Reserve has attracted visitors from all fifty states and six foreign countries. Because of the intimate relationship between the Reserve and the Baldwin County School District, the Reserve annually accommodates 3500-4000 school children and provides educational programs to educate these students on ecology and stewardship of coastal resources. During this time period, educational programs for civic organizations, Elder hostels, and institutes of life-long learning have been developed and serve over 25 groups per year.

The partnership with the Reserve friends group, the Weeks Bay Reserve Foundation (WBRF), continues to strengthen. This 501(c)(3) non-profit group supports the Reserve programs by providing funds, assisting with the quarterly newsletter, maintaining the website at www.weeksbay.org, and pursuing methods of conservation in the Weeks Bay Watershed. The Weeks Bay Reserve Foundation By-Laws are included in Appendix B.

Staffing, Programs, Capitol Improvement and Conservation at the Reserve

More recently, the Reserve staff has reviewed our accomplishments. This review was facilitated by the Reserve having been evaluated by a federal team (December 2003) and undergoing a management plan revision (August 2006). Growth and development has to be recognized with a reflection on the past. Many accomplishments have been recently noted. These include adding several permanent staff positions, developing programs such as the CTP, adding on to both the laboratory and educational facility, acquiring property for conservation, and restoring habitat using science as a guiding tool. Upon visiting the Interpretive Center, one can see that many of these developments are apparent while others will be more elusive.

The Interpretive Center has newly renovated exhibits in the lobby funded by a grant from the National Oceanic and Atmospheric Administration. These exhibits are state of the art in quality and upon closer examination provide a glimpse of the Reserve programs of research, education, and stewardship. Power Point™ presentations are available in the lobby highlighting staff efforts in areas of education, research, monitoring, watershed protection, partnership building, and stewardship. Backlit displays provide information on issues of great importance to protecting the environment and promoting stewardship in the community and throughout the Weeks Bay watershed. The newly renovated exhibits are an attraction to see but one should allow time to explore the subjects and learn more about conserving our coastal resources. Upon reviewing the presentations and displays in the lobby of the Interpretive Center one can gain a glimpse into the issues of the Weeks Bay Coastal Area and the concerns of the staff that will guide the direction of future programs at the Reserve.

Accomplishments at the Reserve are many but the list is too long for short reading. A brief summary could take account of the following: staff positions added in 2003/2004 include a CTP Coordinator, Research Technician, Natural Resources Planner, Cartographic Specialist, and Administrative Support Assistant; development of the Coastal Training Program to provide needed information to coastal managers; federal grants provided funds for dock repairs, boardwalk construction, laboratory expansion, and exhibit renovation; wetland habitat has been acquired on the Fish River and habitats are currently being restored along the nature trail adjacent to the Interpretive Center. These accomplishments all contribute to the efforts of learning more about estuaries and promoting conservation in the Weeks Bay watershed.

Many accomplishments over the last five years represent action items set out in the previous Management Plan (1998). Action items in the previous plan had been collected in many tables with

an indication by year of when planned action would occur. These many itemized successful accomplishments are found compiled in Appendix C.

DIRECTION OF RESERVE PROGRAMS:

The Reserve's resource protection, research, and education programs will continue to support its mission and goals.

School programs will follow the educational curriculum developed in the summer of 1996. Stakeholder/constituent workshops will focus on topics as determined by the CTP Needs Assessment as well as other challenging opportunities that might arise.

An effort will be made to evaluate alternative methods to land acquisition, since past opportunities have been lost due to inadequate funds and elevated land prices. Such methods might be conservation easements or facilitation of third party purchases with conservation in mind.

Research has been facilitated with the hiring of a Research Coordinator. A research technician position has also been added to the staff. In addition, the NERRS Graduate Research Fellowship (GRF) positions offer continued research in the Reserve as well as support for the System-Wide Monitoring Program (SWMP). Research funded by the Cooperative Institute for Coastal & Estuarine Environmental Technology (CICEET) continues to provide opportunities at the Reserve. The volunteer monitoring project will continue and, as the Reserve moves into an tenth year of data collection, a strong effort will be made to evaluate this trend data with GIS technology. Using GIS as a tool to interpret scientific information will provide a more effective method to study problems in the watershed and allow Reserve staff to make best management decisions affecting the estuary.

In 2004, the Reserve established a merit Watershed Coordinator position and incorporated a watershed protection program that included water quality monitoring, outreach, and resource protection activities. The watershed program will partner with the Citizens Advisory Committee (CAC) of the WBWP and other federal, state, and local entities to assess and promote cooperative remedies to water quality issues in the Weeks Bay Watershed. A summary of the history of the Weeks Bay Watershed Project is included in Appendix D.

III. ADMINISTRATION PLAN

Administration of the Reserve will oversee all activities by establishing a framework for implementing and evaluating staff and programs, managing and soliciting funds and coordinating activities of the Reserve. The Administration framework ensures that management activities are coordinated and encourages support for local and state user groups. Management of the Reserve is a collective effort involving the administrative agencies, Reserve staff, local and state agencies, user groups and the Reserve Advisory Committee.

LEAD AGENCY

Alabama Department of Conservation and Natural Resources

The cooperating state agency for the Reserve is the Alabama Department of Conservation and Natural Resources (ADCNR), an executive agency of the Alabama state government. The Commissioner of ADCNR is appointed by and reports directly to the Governor. Within ADCNR, the Reserve is located in the Coastal Section of the State Lands Division. The Coastal Section houses the Reserve, and the Coastal Zone Management Program. Reserve staff are ADCNR employees either state merit or under contract, with the exception of the Education Coordinator, who is employed by the Baldwin County Board of Education.

Administrative services, including accounting services for grants and other fiscal activities, personnel services, purchasing, legal counsel and legislative liaison are provided by the Administrative Division of ADCNR for the Reserve. These services are funded by an indirect cost charged to the NERR program as a percent of the funds handled by the Department for the NERR. The indirect cost in FY 2003/2004 was 13%. State match and other state funds used for the Reserve are provided by a general use tax fund.

Alabama Department of Conservation and Natural Resources (ADCNR) is composed of the Wildlife and Freshwater Fisheries Division, State Lands Division, State Parks Division, Marine Police, and Marine Resources Division. ADCNR is charged with administering laws pertaining to wildlife protection and conservation, including game and fish laws, boat registration, management and protection of marine resources and acquiring land for parks. In addition, ADCNR has jurisdiction over all state owned lands including submerged lands and public trust lands. ADCNR, State Lands Division holds title to the Weeks Bay benthos.

The Marine Resources Division, Wildlife and Freshwater Fisheries Division supports the Reserve in an advisory capacity with members on the Reserve Advisory Committee. The Marine Police Division provides surveillance in the Reserve.

SUPPORTING AGENCIES:

Alabama Department of Environmental Management (ADEM)

ADEM administers environmental legislation, reviews and issues permits concerning activities in the coastal areas, promulgates regulations and standards and develops environmental policy for the state. ADEM is the regulatory, permitting, monitoring and enforcement arm of the Alabama CZM Program. It also serves as the state's clearinghouse for environmental data and administers federally-designated environmental projects. ADEM provides the coastal regulatory controls and enforcement of coastal development authorities. ADEM serves the Reserve in an advisory capacity with a member on the Reserve Advisory Committee.

The Weeks Bay Advisory Committee

The Weeks Bay Advisory Committee was established during the initial stages of the Reserve designation efforts to advise the management. This Committee is composed of members from a variety of agencies and institutions providing a wide range of expertise. The Weeks Bay Advisory Committee is a group of local and state-wide representatives who serve to advise management on matters of operations at the Reserve. The Advisory Committee promotes the Reserve by seeking support for the programs. Since Committee members are involved in community efforts, they also inform management of needs, concerns, and interests of citizens using the Reserve. Sub-committees may be formed as needed to address such topics as research, and education.

The Weeks Bay Advisory Committee is composed of eighteen members that include:

Agency Representatives

1. Alabama Department of Conservation and Natural Resources, Wildlife and Freshwater Fisheries Division (appointed by the ADCNR Commissioner).

2. Alabama Department of Conservation and Natural Resources, Marine Resources Division (appointed by the ADCNR Commissioner).

3. Alabama Department of Conservation and Natural Resources, Land Division (appointed by the ADCNR Commissioner).

4. Alabama Department of Environmental Management (appointed by the Director of the ADEM Mobile Field Office).

5. Alabama Senate - Seat No. 32.

6. Alabama House of Representatives - Seat No. 94.

7. Baldwin County Board of Education (appointed by the Baldwin County Superintendent).

8. Marine Environmental Sciences Consortium (a.k.a. Dauphin Island Sea Lab, appointed by the MESC Director).

9. Baldwin County Commission (appointed by the Chairperson).

10. Auburn Marine Extension and Research Center (appointed by the Director).

11. Environmental Studies Center, Mobile County Board of Education (appointed by the Director).

12. Faulkner State Community College (appointed by the President).

Citizen Representatives

Six additional members appointed by the Governor for the duration of his/her term.

Two Non-Voting Members:

1. Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section Chief.

2. Weeks Bay Reserve Foundation (appointed by the President).

CZM PARTICIPATION

The relationship between the Reserve and the Alabama CZM Program is assured by several means. The Reserve Manager reports to the CZM Program Manager who is also the Coastal Section Chief of the Lands Division, ADCNR. The Coastal Section CZM and Reserve staffs interact regularly in the coastal area and with the State Lands Director, Assistant Director, and staff. The Reserve is represented on the CZM Technical Interagency Committee (TIC) and the CZM Program is represented on the Weeks Bay Advisory Committee.

The CZM Program supports the Reserve through funding, program policy, and regulations. Where funds are available and their use not prohibited by federal or state guidelines, the CZM Program supports the activities of the Reserve financially. Additionally, the CZM Program recognizes and reinforces the goals of the Reserve and the Alabama Department of Environmental Management promotes the resource protection program of the Reserve wherever feasible.

In addition to the coordination and support activities outlined above there are two areas - public education and research - that the Reserve has a leading role and supports the CZM Program. A large portion of the public education/outreach needs of the Alabama CZM Program, particularly that directed toward the age groups K-12, are met by the programs of the Reserve. The CTP will enhance collaborative opportunities as well. Recognition of this and closer coordination of education/outreach activities is a priority of both programs. As the research tracking and coordination capabilities of the Reserve increase there will be the opportunity for the Reserve to become the research coordinating and directing arm of the CZM Program. In this capacity the Reserve would, with the CZM Program, determine the need and help arrange research useful to both programs and to the wider coastal resource management effort.

LOCAL AGENCY SUPPORT

The Baldwin County Board of Education (BCBE) assists the Reserve Administration (in accordance with the existing Memorandum of Understanding) by providing financial support for the Education Coordinator and supporting materials. Additionally, a representative of the Board serves on the Reserve Advisory Committee. This agency is integral to the success of the educational program. The Baldwin County Commission also assists the Reserve in an advisory capacity by appointing a representative to the Advisory Committee. The director of the Environmental Studies Center, an educational center for Mobile County Schools, appoints a representative to the Advisory Committee as well.

SUPPORT ORGANIZATIONS

Weeks Bay Reserve Foundation (hereafter referred to as the Foundation)

The Weeks Bay Reserve Foundation was incorporated as a non-profit corporation to provide supportive funding and resources for the Reserve. The Foundation seeks funding through donations, grants, and membership fees, facilitates property acquisition, and supports special activities.

Weeks Bay Volunteers

The Weeks Bay Volunteers was established as an unincorporated non-profit association in 1997. The primary purpose of this association is to aid the Reserve by organizing volunteers to actively assist the staff in their education, research, and resource protection functions. A board of seven directors is vested to manage the affairs of this association in accordance with its constitution and by-laws. An annual business meeting is held on the 2nd Tuesday of January. Board meetings are held quarterly on

the 2nd Tuesday of the month. The Reserve Manager, or his/her designee, shall receive prior notification of and furnish advice for any project undertaken on behalf of the Reserve. Through fundraising activities, the volunteers support many projects to assist the Reserve.

The goals, objectives, and actions included in the Administrative Plan are as follows:

Goal: Protect and improve habitat and biological diversity within the boundary of the Reserve.

Objective: Solicit and obtain funds to support habitat and biological diversity.

Actions:

a. Provide grant administration support to ensure that funds are solicited and managed efficiently.

b. Write grants to secure funding in support of habitat and biological diversity within the Reserve.

Goal: Promote education, stewardship, and scientific research focusing on estuarine ecosystems.

Objective: Facilitate administrative and financial management of Reserve research, education, and outreach programs.

Actions:

a. Provide grant administration support to ensure that funds are managed efficiently.

b. Write grants to secure funding for programmatic support.

c. Participate in NERR System meetings to support NERRS Program.

Objective: Provide administrative staffing and facilities to support Reserve programs.

a. Target agency capabilities to meet needs of Reserve programs with reference to the Weeks Bay Reserve Long Range Plan (Appendix L).

b. Employ additional staff as needed to support Reserve programs. Increased staffing will facilitate internal research, education, and outreach programs with reference to the Weeks Bay Reserve Long Range Plan (Appendix L).

c. Create usable and efficient staff workspace to allow better coordination between programs.
The Administration will work to improve existing facilities to better house staff, programs, and visitors. This includes the development and implementation of the Facility Master Plan Study and Design with reference to the Weeks Bay Reserve Long Range Plan (Appendix L).

d. Clarify and revise the roles and capabilities of federal, state, and local governments or agencies.

e. Purchase equipment and supplies to enhance staff productivity. The Administration will prioritize and purchase equipment and supplies for programs. Included in this list are a covered pontoon boat, an open water work boat and additional vehicles as needed and resources allow.

Objective: Improve and enhance partnerships to benefit Reserve programs.

Actions:

a. Develop Memoranda of Understanding (MOU) with local, state, and federal organizations. The focus of these MOUs would be cooperative understanding and protection of the Reserve resources. In a way, the Reserve will strengthen existing relationships with regulatory protection agencies, research and monitoring organizations/institutions, and educational organizations.

b. Facilitate partnerships with local agencies to support Reserve programs.

IV. STEWARDSHIP

Good stewardship practices will be utilized to protect, enhance, and restore ecological integrity within the Reserve for long-term research, education, and management. Also, Reserve programs will provide outreach and instruction on the use of good stewardship practices and use of these practices in the coastal community.

Stewardship is the effort to manage, protect and preserve the natural resources contained within the Reserve by: 1) evaluating natural and anthropogenic processes affecting the resources, 2) initiating and supporting research and monitoring, and 3) actively educating the public. Informed management of the resources at the Reserve has been facilitated by collective input from various advisory, technical, education, and citizen groups.

RESOURCE PROTECTION

The Reserve serves in part as a national, regional, and local center of information on coastal and estuarine resources. The Reserve is an outdoor laboratory for study, providing opportunities for monitoring, research, education, and restoration management activities. It serves as a testing ground for applied coastal management techniques, and as a point of contact and outreach for federal, state, and other relevant agencies and organizations.

The Reserve serves as a regional source of objective and integrated information on the role of estuaries in marine ecosystems, the role of governments in their protection and management, and the need for individual responsibility and stewardship. The Reserve also involves itself pro-actively in land use issues within its watershed or areas that could potentially affect the Reserve resources. South Baldwin County has a rapidly growing population, and the Reserve will play an active role in an effective program of technical assistance to promote informed coastal management decisions.

The natural resources within the Weeks Bay Reserve and its watershed encompass both terrestrial and aquatic habitats. The lands held by ADCNR/SLD are primarily terrestrial with some pond, swamp, marsh and stream habitats. Included too, are the submerged lands (i.e., water bottoms) of Weeks Bay and its tributaries to the limit of tidal influence. These sensitive areas are composed of emergent marsh, submerged aquatic vegetation, soft bottom and open water habitats. In an effort to protect these various living resources of coastal Alabama and maintain them in a natural state, management strategies provide guidance when issues arise that adversely impact various habitats. As an example, management of habitats to control or eliminate exotic invasive species is achieved through various Reserve actions.

Development activities continue to be issues of concern for resource protection. An increase in permit requests for building extensive piers over State lands in Weeks Bay led to the establishment of a pier task force in 1994 composed of members from state and federal agencies including: Alabama Department of Environmental Management, Alabama Department of Economic and Community Affairs, ADCNR (State Lands and Marine Resources Divisions), CZM, COE, and the Marine Environmental Sciences Consortium (MESC). Efforts of the task force resulted in recommendations on structural guidelines and shoreline alterations (see Appendix F). These formalized pier criteria remain in force and are utilized by the U.S. COE and ADCNR State Lands Division for permit issuance. As part of the criteria, dredging is prohibited within the boundaries of the Weeks Bay Reserve. Further, the Reserve strongly recommends that the County Commission deny requests to rezone lands to allow increasing development density and adhere to the land use plans established by planning commissions/zoning boards. These examples illustrate the need for the Reserve to promote stewardship and provide guidance in the area of resource protection.

An estimated 3,000 acres of previously converted wetlands for agricultural purposes are located within the Weeks Bay watershed. Wetlands trap soil particles and attached pollutants associated with upstream runoff. The loss of these wetlands and their associated water quality functions has contributed to nutrient loads and sedimentation in many of the tributaries and portions of Fish and Magnolia Rivers as well as Weeks Bay. Land use/land cover and nonpoint source pollution (NPS) resulting from urbanization/residential development in the Weeks Bay watershed contribute high levels of nitrate. Other major contributors are agriculture and sod production.

Land use changes in the watershed may potentially be the greatest threat to coastal resources. Where and how development occurs has direct implications to water quality, aquatic species, and wildlife habitat. Waterfront development and bulkheading of shoreline are primary concerns. Riparian vegetation plays an important role in reducing turbidity by trapping sediment, providing thermal cover to prevent water temperature extremes, and taking up excess nutrients that may be present in runoff. Shoreline vegetation absorbs wave energy and reduces erosion. Floodplain habitat reduces the height and velocity of flood waters. Waterfront development and bulkheading will greatly reduce these natural protections for water quality and wildlife habitat.

Light penetration reduced by sediment and plankton in the water column, may limit submerged aquatic vegetation (SAV) abundance in Weeks Bay. Stout and Lelong (1981) located only two small patches of SAV less than an acre each, near the mouth of the bay at Muddy Bayou to the west and Williams Creek just inside the bay to the east. Species present were mostly freshwater aquatics (*Valisneria americana*, *Myriophyllum spicatum* and *Potamogeton pectinatus*), except for the brackish widgeon grass (*Ruppia maritima*). Recent surveys of these sites failed to locate these beds. Although SAV habitats are ephemeral, the lack of recovery or establishment of new grassbeds is a concern. Resource protection efforts will focus on reducing negative anthropogenic impact on coastal resources and, when possible, restoring habitats to their natural state. The Reserve will closely monitor all activities in and around the area. Uses that alter the existing natural state may not be permissible and guidance will be provided to local jurisdictions on development of policies on topics such as piers, boathouses, and shoreline stabilization.

The goals, objectives, and actions of the Resource Protection Plan are:

Goal: Protect and improve habitat and biological diversity within the boundary of the Reserve.

Objective: The Reserve will manage natural resources to maintain and restore ecosystem function.

Actions:

a. Classify Reserve habitats according to NERRS Stewardship and Management goals. A focus of Resource Protection is to integrate information in order to identify existing problems and potential impacts to Reserve holdings and water quality. Consequently, a resource classification will be used to evaluate each habitat/land tract managed by the Reserve and determine its long-term best use (i.e., protection, research, education, public access).

b. Evaluate impact versus benefit of Reserve management activities.

c. Assess the potential uses of conservation easements as a strategy for land protection adjacent to the Reserve.

Objective: Restore and protect habitat, through land acquisition, education, and incentive programs.

Actions:

a. Develop criteria to prioritize Reserve land acquisition by identifying areas with habitat restoration needs. Criteria will utilize previous work in the Weeks Bay Coastal Area to determine areas of high value with respect to significant ecologic areas, intact habitat, and biological diversity. Development of criteria will be accomplished by Reserve staff in coordination with local and regional partners. Priority areas will be lands adjacent to the Reserve and in project areas identified for acquisition.

b. Establish and maintain wildlife best management practices within the Reserve. The Reserve will review potential anthropogenic impacts on the resources and the pros and cons of management decisions with respect to long range goals.

c. Provide best management practice guidance to local and state regulatory agencies upon request and via workshops and seminars. This will entail providing information on best management practices and alternative solutions to potential problems (i.e., created wetland septic systems, conservation easements). The Reserve will also review permits and evaluate impact versus benefit of management activities.

Goal: Improve decisions affecting estuarine and coastal resources.

Objective: Research and monitoring data will become the basis for better-informed coastal management decisions.

Actions:

a. Use Geographic Information Systems (GIS) to evaluate land use information, physical and biological watershed characteristics and chemical water quality data. The Reserve will generate long-term data sets on water quality and habitat integrity to support decision-making to promote wise use of the resources. Specifically, data will be compiled into GIS format, creating databases including land type, physical parameters, and biological parameters. These databases will be utilized to generate graphs and maps which will serve as tools to evaluate management issues as they relate to resource protection research and education. This information will also be disseminated to the WBAC, regulatory agencies, and public interest groups.

b. Provide usable data and analysis for evaluation by Reserve staff, advisory committees and regulatory organizations. GIS is an effective tool for educating the public about wise use of resources. One primary focus of the reserve will be the use of this information its integration into educational programs. It has been shown that educated and informed citizens assist in resource protection by individually taking responsibility. In this way, the public itself takes an active role in managing and minimizing impacts to local resources.

c. Evaluate COE and ADEM permit applications for construction, land use changes, habitat alterations. Make comments where appropriate and forward to SLD Coastal Section. Comments on permit applications are important as this provides a mechanism to keep check on activities in the Reserve area and potential changes in land use. In many cases, such changes may result in a negative impact on water quality or loss of habitat. Review of permits can provide alternatives that could reduce negative impacts and offer an opportunity to provide alternative methods.

Goal: Promote education, stewardship, and scientific research focusing on estuarine ecosystems.

Objective**:** Improve exhibits and outreach initiatives to support Reserve programs.

Actions:

a. Expand interpretive program through creative exhibits, and public workshops to protect vital habitats including submerged grasslands, fringe marsh, shoreline, and other wetlands and upland forests.

b. Conduct workshops and tours and distribute literature that addresses issues such as the importance of wetland protection, the impacts from wetland loss, water quality issues, conservation easements, and wise land use planning and practices.

Objective**:** Provide for long-term support and involvement of watershed residents in watershed planning and management activities.

Actions:

a. Assist NRCS and USFWS in informing landowners of the availability of federal cost – share assistance for habitat protection. Many programs are already in place to assist landowners in habitat restoration and protection activities, however many landowners are not aware that programs are available or do not rank habitat protection as a management priority.

b. Develop educational programs that include literature, workshops, and press releases on conservation options and write grants to fund additional programs which will provide assistance to landowners for restoration activities.

c. Encourage the adoption of county/local ordinances for onsite sewage treatment and disposal. These will contain more stringent requirements for approving OSDSs, for homeowner maintenance and repair, and for effluent quality before infiltration to soil. It will also encourage communities to use small, decentralized, onsite sewage treatment and disposal systems with adequate operation and maintenance by certified operators.

d. Promote planning and zoning to protect environmentally sensitive areas. Specifically, the Reserve will identify areas that contain sensitive and rare habitats that, due to soil constraints, are unsuitable for certain types of development, and continue to track land use changes in the watershed. It is necessary to educate residents on planning, zoning, and the importance of retaining natural areas.

e. Encourage the Baldwin County Commission (BCC) to amend Subdivision Regulations to require increased water retention and require that ponds are not situated in environmentally sensitive areas. Research has determined that once impervious cover exceeds 10%, the following changes can be expected: increased flood peaks, lower dry weather flow, increased pollutant loads, decline in fish diversity, and decline in wetland plant and animal diversity (Booth and Jackson, 1997; Holland et al., 2004).

ALLOWABLE ACTIVITIES:

The Reserve and Advisory Boards have established a list of allowable activities. Activities approved for the general public within Reserve properties or managed areas include:

- Hiking on approved trails
- Photography while remaining in approved areas
- Swimming and boating within Weeks Bay, rivers, and tributaries
- Recreational fishing in Reserve (Weeks Bay and its tributaries), except for species listed under state and federal laws (e.g. shrimp)

Changes in allowable activities may occur due to changes in habitat resources or increased public activity in the future.

PROHIBITED ACTIVITIES:

In accordance with local, state, and federal agencies, the Reserve has established activities that are prohibited to the general public within Reserve properties or managed areas. These activities currently include, but are not limited to:

- Camping
- Hunting
- Fires
- Overnight parking
- Theft or destruction of natural resources and properties of the State.
- Fishing activities as dictated by state and federal laws

Additionally, any activities not listed, but prohibited by local, state and federal regulations, are also prohibited within the Reserve boundaries and its managed resources. Changes in prohibited activities may occur due to Reserve developments in the future.

ACTIONS ALLOWABLE WITH PERMIT OR PERMISSION:

To accomplish the goals of good stewardship and resource protection, several actions that may be prohibited are, upon approval, permissible on Reserve holdings provided that they do not cause permanent damage to the resources. Specifically, approved research and resource manipulation activities that require the use of specific actions that are prohibited, are allowed, with permission, as long as they do not permanently impact the resources (see sections IV and VIII; Resource Manipulation and Research and Monitoring). Additionally, resource collection permits may also be required, and individuals will need to acquire the necessary permits according to ADCNR guidelines. Regardless of the action, all activities will require prior notification to, and permission of, the Reserve.

RESOURCE PROTECTION POLICIES OF ADCNR

The Reserve is maintained as an estuarine fish and wildlife habitat, and a natural field laboratory for research and education/interpretation. The Reserve area is managed according to specific policies designed to protect the habitat integrity and natural setting of the site while allowing for continuation of traditional compatible uses. Methods for site and habitat protection include, yet are not limited to, land acquisition through purchase or donation, conservation easements; application of state, federal, and local laws and regulations for land use planning and zoning in cooperation with local governments; resource monitoring and research; and public education and outreach.

Traditional Activities/Uses:

It is the policy of the Reserve to continue traditional uses of the coastal resources in the Reserve that are compatible with the goals of the Reserve. These include boating, fishing, swimming, crabbing, bird watching and photography as these activities / uses are governed by appropriate agencies.

Watercraft:

It is the policy of the Reserve to encourage operation of watercraft in a manner that is compatible with the goals of the Reserve particularly in the maintenance of the wild habitat and natural setting. Examples of incompatible activities would include those that create excessive wave action (wakes), excessive noise, excessive petroleum product pollution (jet skis), or excessive disturbance of benthic organisms. Watercraft should not exceed idle speed outside of marked channels due to threats from underwater obstructions and shallow water. The Reserve encourages compatible activities through public education/information and public outreach efforts and development of applicable regulations in cooperation with appropriate agencies if necessary.

Fisheries:

It is the policy of the Reserve to encourage fishing activities that are compatible with the goals of the Reserve particularly the maintenance of the wildlife habitat and providing a natural research laboratory. Commercial shrimping is not allowed within Weeks Bay. Commercial gillnetting, and crabbing and recreational fishing and crabbing are allowed. Activities that result in depletion of fisheries or diminish the education or research goals of the Reserve will be discouraged. The Reserve will encourage compatible activities through public education/information and public outreach efforts and the development of applicable regulations in cooperation with appropriate agencies if necessary.

Submerged Lands:

It is the policy of the Reserve to discourage activities on, or uses of, submerged lands in the Reserve coastal area which are not compatible with the goals of the Reserve, particularly those which would significantly alter the water currents or flow, either riverine or tidal, physically disturb benthic organisms or diminish sunlight reaching submerged lands. Examples of incompatible activities/uses include dredging of channels, operation of watercraft in too shallow water and construction of structures which result in more than minimum shading of submerged lands (see Piers & Docks). The Reserve encourages compatible activities through public education/information and public outreach efforts and the development of applicable regulations in cooperation with appropriate agencies.

Shoreline:

At the estuarine shoreline are located emergent and fringe wetlands which protect the land from erosion and provide habitat for fish and other marine organisms. The adjacent buffer strip provides protection from nonpoint source pollution, and a natural setting for the estuary. It is the policy of the Reserve to discourage activities or uses of the shoreline in the Reserve coastal area that are not compatible with the goals of the Reserve, particularly those which significantly alter the shoreline or buffer strip. The Reserve discourages alteration of emergent or fringe wetlands, construction of bulkheads, and clearing of natural cover from the buffer strip. Conversely, the Reserve encourages restoration of fringe wetlands, non-structural means of stabilizing shoreline and protections of the natural vegetation in the buffer strip. The Reserve encourages compatible activities through public education/information and public outreach efforts, the development of applicable regulations and zoning ordinances in cooperation with appropriate agencies, local governments, and the purchase of conservation easements.

Wetlands:

It is the policy of the Reserve to discourage activities in or uses of wetlands in the Reserve coastal area that are not compatible with the goals of the Reserve. Specified activities that would be discouraged include activities that would result in the dredging, filling or shading of wetlands. It is the policy of the Reserve to support the wetlands regulatory program of ADEM/COE as embodied in Section 404 of the Clean Water Act and ADEM Division 8: Coastal Program Regulations and to facilitate that program by working with ADEM to develop regulations applicable to the Reserve coastal area. This includes commenting on permit applications affecting the Wetlands, and monitoring and reporting to ADEM activities in wetlands in the Reserve. Within the Reserve boundary, the Reserve management proposes no activities that alter wetlands except those necessary to support the educational or research goals of the Reserve.

Water Quality:

It is the policy of the Reserve to discourage activities related to or uses of ground or surface water in the Reserve coastal area and the Weeks Bay watershed that significantly diminish the water quality in those areas. Such activities or uses include nonpoint source pollution from run-off or septic tank leaching, point source discharges in the bay or watershed and contamination of ground water. The Reserve management works with ADEM through the Section 319 Nonpoint Source Pollution Program, Division 8: Coastal Program Regulations, and National Pollutant Discharge Elimination System regulations and the provisions of the ONRW designation (see Appendix G). These efforts include working with ADEM to develop regulations applicable to the Reserve, commenting on permit applications affecting the Reserve, and reporting activities affecting water quality. The Reserve management also works with the federal, state, and local entities to reduce nonpoint source pollution through public education/outreach and cooperative projects. The Reserve management works with the Baldwin County Health Department to assess and reduce nonpoint source pollution caused by septic tanks through public outreach and assistance, and provides assistance in monitoring and developing regulations.

Wildlife and Wildlife Habitat (Including Endangered and Threatened Species)

It is the policy of the Reserve to encourage activities related to wildlife and wildlife habitat that are compatible with the goals of the Reserve including the maintenance of wildlife habitat, particularly cover and forage, the protection of endangered and threatened species, and the provision of a natural research laboratory. Within the Reserve, wildlife is surveyed and monitored to enhance protection. Activities which enhance the protection of wildlife and wildlife habitat in the Reserve coastal area are encouraged through public education/outreach efforts, and when necessary, applicable regulations are developed in cooperation with the appropriate agencies.

Lands:

It is the policy of the Reserve to manage Reserve lands in order to protect the natural setting, maintain and enhance wildlife habitat and ensure the maintenance of the natural research laboratory. Management activities undertaken are designed to prevent nonpoint source pollution, particularly sedimentation, maintain shoreline buffer strips, restore habitats through prescribed burns, replanting, and maintain vegetation for wildlife cover and forage. The Reserve encourages these activities and promotes low density development in the Reserve coastal area and in the Weeks Bay watershed through public education/outreach activities and projects in cooperation with local agencies and governments.

Piers and Docks:

Due to the potential impact of piers, docks, and related structures on water quality, submerged lands, fringe wetlands, and the Weeks Bay shoreline a set of criteria have been developed for their

construction. The Pier Criteria (see Appendix F) were developed in 1995 with the cooperation of ADEM, ADCNR, COE, and the Dauphin Island Sea Lab (DISL). These criteria are used to evaluate the construction of piers and docks since 1996.

Air Quality:

It is the policy of the Reserve to manage activities on the Reserve so as not to diminish air quality below standards established by ADEM and to discourage such activities outside the Reserve through the monitoring of air quality and reporting air quality problems to ADEM.

Nonpoint Source Pollution:

It is the policy of the Reserve to manage activities and uses on the Reserve in a manner that minimizes nonpoint source pollution primarily through the application of best management practices (BMPs). The Reserve coordinates with local governments and agencies, with the CAC, with the ADEM Section 319 program and with the CZM Section 6217 program to encourage similar approaches to minimize nonpoint source pollution in the Reserve coastal area and Weeks Bay watershed. This involves public education/outreach programs and cooperative projects, monitoring and reporting NPS pollutants, and working with applicable agencies to develop appropriate BMPs. Specific areas of NPS pollution to be addressed include: 1) sedimentation from residential and commercial construction, maintenance of roads and road right-of-ways and agricultural uses, 2) nutrient enrichment from fertilizer run-off and septic tank leaching, 3) herbicide and pesticide run-off and 4) trash and debris on both land and water.

ENFORCEMENT/SURVEILLANCE PROGRAM

Surveillance and enforcement activities require the coordination of law enforcement agencies (Marine Police and Baldwin County Sheriff), establishment of patrol schedules, and assessment. Reserve policy will provide guidelines for enforcement procedures. The Reserve Manager has responsibility for ensuring that all activities conducted within the Reserve conform with NERRS Guidelines for resource protection. The Reserve Manager will contact the Baldwin County Sheriff, Game Wardens, and Marine Police as necessary, and will be a full partner in the review of any permit affecting the Reserve's resources.

RESTORATION PLAN

A priority for the Reserve is to restore the temporal and spatial diversity inherent in a healthy ecosystem. The Reserve will take steps to quantify habitat loss and alteration on land within the Reserve boundary and other managed areas. Steps will be taken to determine the extent and cause of degradation and evaluate the optimal conditions to which the habitat can be returned and feasibility of returning the area to pre-disturbance conditions, or to a sub-optimal condition that assists in resource protection.

The goals, objectives, and strategies of the Restoration Plan are:

Goal: Protect and improve habitat and biological diversity within the boundary of the Reserve.

Objective: Restore and protect habitat, through land acquisition, education, and incentive programs.

Actions:

a. Determine the need for restoration of Reserve owned properties by assessing the habitat value of each parcel. Efforts will be focused on restoring habitats that have been altered by human activities leading to decreased habitat diversity within the Reserve boundary. This will be accomplished by determining historical distribution of habitat within the Reserve boundary and weighing this information against the habitat needs in the region. The program will utilize historic aerial photographs, USDA crop records, and conduct interviews with local residents to identify areas of significant habitat alteration to identify potential areas for restoration activities. Priority will be given to restoration projects that will require minimal resources to maintain restored habitat. For example, plugging ditches on prior converted (drained) wetlands would require minimal management and should respond well to restoration. Due to the agricultural history of Baldwin County, ample opportunity for restoring prior converted wetlands should exist.

b. Continue evaluation of Reserve habitats and identify rare or threatened habitat types in a local and regional context. Riparian areas provide valuable habitat and improve water quality in downstream waters. Restoration of riparian buffers will be encouraged on private lands within the watershed. Where possible, technical assistance and volunteer assistance will be provided to landowners.

c. Coordinate with state and federal agencies to minimize loss and restore habitats. Restoration of habitats at the Reserve include the Weeks Bay Pitcher Plant Bog, Nature Trail Restoration Area, shoreline restoration through the Baldwin County Grasses in Classes program, and various research projects.

d. Identify suitable sites to restore rare or threatened habitats. Restoration efforts that reconnect isolated natural areas and/or expand existing natural areas will have the greatest likelihood of restoring the temporal and spatial diversity inherent in healthy ecosystems.

e. Co-management of the Swift Tract in coordination with the Weeks Bay Mitigation Bank. A large area of land is owned by a private group adjacent to the Swift tract. This encompasses a little over 1,700 acres and the owners, Wetlands Restoration, L.L.C., sponsor a mitigation bank, the Weeks Bay Mitigation Bank, and will transfer this property to ADCNR at some future time. Following the complete sale of credits

(end of operational life of the bank) and the transfer of title to ADCNR, the restored lands will be incorporated into the boundary of the Reserve.

The purpose of the mitigation activities on the adjacent property is to restore, create, enhance, and preserve the “wetlands” status of the mitigation bank lands. The target habitat is Pine Savannah representing a coastal ecosystem rich in diversity. A mitigation bank review team made up of representative State and Federal agencies approved the management plan submitted by the mitigation bank. ADCNR has agreed to have restoration activities on the Swift tract follow the management goals and objectives of the mitigation bank plan. The expected outcome of these co-managed activities is to enhance the Swift tract and eventually establish an additional 1,700 acres of Pine Savannah for the Reserve. This in effect would provide over 2,300 contiguous acres of protected coastal resources next to Bon Secour Bay.

RESOURCE MANIPULATION

Although the goal of the Reserve is to protect the resources within the Reserve boundaries, the overall goal of good Stewardship suggests that restoration and research are necessary components of managing the Reserve properties. Currently, manipulative efforts to restore habitats, increase habitat diversity, increase accessibility for public interpretation, and conduct research activities are sanctioned as long as they do not conflict with overall management objectives of Resource Protection.

The goals, objectives, and actions of the Resource Manipulation plan are:

Goal: Protect and improve habitat and biological diversity within the boundary of the Reserve.

Objective: The Reserve will manage natural resources to maintain and restore ecosystem function.

Actions:

a. Continue resource management activities such as prescribed burning of appropriate habitats. The Reserve's Pitcher Plant Bog represents what was once a major habitat along the northern Gulf Coast. Nationwide, only 2% of this unique habitat remains. The carnivorous plant bog habitat is fire dependent and during the last five decades of development and increased fire protection, much of the habitat has been lost. To restore the habitat, the Pitcher Plant Bog Restoration Project involves controlled burning of 45 to 50 acres of the Foley Tract in cooperation with the ADCNR/SLD. These periodic burnings prohibit encroachment of competitive flora and allow the bog habit to flourish. Overall the pitcher plant bog restoration is progressing in response to the prescribed burning activities.

b. Establish access to diverse habitats if appropriate and beneficial. Areas requiring some degree of manipulation to establish or maintain access for the purposes of recreation, interpretation, research or management will be identified. An approved method of access is or will be determined to all current and future Reserve holdings. The Reserve staff maintains access to all properties for emergency, management and research purposes. If necessary, adjacent landowners are contacted to secure access on remote sites. For example, the pitcher plant bog restoration includes a public access point and elevated boardwalk for interpretive purposes.

c. Manage wildlife enhancement projects. A 15-25 acre upland area of the Foley Tract adjacent to the upland trail will be managed to provide better habitat for a gopher tortoise population. A survey and recommendation for this area is complete. A thinning of the forested area would be followed with a very limited burn. This would provide an open area for herbaceous plants to flourish thus enhancing the habitat for the gopher tortoise.

Objective: Restore and protect habitat, through land acquisition, education, and incentive programs.

Actions:

a. Identify resource manipulation projects and investigations that would benefit the Reserve and restore habitats. Examples of manipulation projects include fire management in the Pitcher Plant Bog and Nature Trail area, restoring hydrology

west of the Interpretive Center, and ongoing efforts to remove exotic invasive species.

b. Evaluate Reserve properties and habitats for research projects and scientific investigations. Some tracts will be restored or actively managed requiring the manipulation of vegetative and /or hydrology (see Restoration Plan). These activities will provide unique opportunities for scientist to monitor the response of the habitat to management initiatives. For example, the Swift tract provides an opportunity for investigation of pine savannah/pitcher plant bog restoration.

c. Evaluate Reserve properties to make most efficient use of resources for public outreach and environmental education. The Reserve will identify sites suitable for public access for the purpose of interpretation and demonstration projects (i.e., trails on Foley Tract). Public access areas should be adjacent to parking, provide safe trails, and located away from potential hazards such as flood prone areas and highways. Resource manipulation will be required to maintain areas for public access purposes. Sites will be selected that will minimize public impact on the resource.

V. BOUNDARY AND ACQUISITION PLAN

The original concept for the boundary of the Weeks Bay Reserve, and that used today, encompasses those tracts of land owned by or dedicated to the Reserve tied together by the water bottoms- the inter-tidal area up to the mean high tide line of Weeks Bay, portions of Fish and Magnolia Rivers, and Bon Secour Bay. The current boundary was delineated in 1985 in the Weeks Bay Final Environmental Impact Statement and Management Plan. This boundary concept continues today with plans to incorporate land parcels acquired by the State of Alabama into the Reserve boundary.

Expansion of the Reserve boundary is consistent with the NERRS goals as previously stated. The new boundary will include land and water portions of the Weeks Bay estuarine system that have been acquired due to ecological significance and availability. The newly acquired lands will be incorporated into the Reserve upon NOAA approval of the boundary expansion and increase the land area managed for conservation by (333 acres).

The Reserve intends to further expand its boundaries in future years to include tracts that are environmentally significant and will contribute to the overall ecologic integrity of the Weeks Bay estuarine system. All land acquisitions planned by the Reserve will contribute to conservation in an effort to include all of the key land and water portions of the estuary, and adjacent transitional areas and uplands constituting to the extent feasible, a natural unit. These lands, through conservation management, will be set aside as a natural field laboratory to provide long-term opportunities for research, education, restoration, and interpretation.

The goals, objectives, and strategies of the Boundary and Acquisition Plan are:

Goal: Protect and improve habitat and biological diversity within the boundary of the Reserve.

Objective: Prioritize habitat areas and land tracts for acquisition within the Weeks Bay Coastal Area according to their contributions to ecosystem function.

Actions:

a. Describe land tracts by land use. The Reserve in cooperation with the Alabama Natural Heritage Program, the Nature Conservancy (TNC), and ADEM, developed a program that identifies and prioritizes lands in the Weeks Bay Coastal Area for acquisition. This Program has developed a GIS database incorporating impacted sensitive lands, significant wetlands, and habitat for indicator species.

b. Identify ecologically significant estuarine habitats. Land use information is layered and a watershed non-point source pollution profile generated. In this way, key ecological areas will be identified and prioritized for purchase.

c. Identify existing and/or potentially disruptive land uses.

Objective: Develop land acquisition methods and conservation initiatives to protect ecologically valuable habitats and expand Reserve boundaries.

Actions:

a. Organize funding strategies to provide resources for the Reserve. The land acquisition plan has been developed that coordinates and leverages funds to make possible the purchase of high priority parcels. This involves continual monitoring of the status of parcels with regard to availability and of the status of funds available for acquisition purposes. Annual communication or meeting with eligible landowners, as well as annual meetings with funding agencies or sources will be held.

b. Provide conservation mechanisms within the watershed. The Reserve will continue to pursue funds to purchase properties, work with landowners to explore conservation easements, and encourage donations of property. Areas outside of the five project areas should also be considered if they contain lands that would significantly protect the Weeks Bay estuary from negative impacts such as NPS pollution or provide significant benefit to the environmental characteristics of the area.

c. Assist organization of community efforts towards conservation. Due to the lead time often required to obtain funds from government agencies for acquisition and the speed with which properties often come on the market, the Weeks Bay Reserve Foundation will be encouraged to maintain funds to initiate acquisition while other funds are sought.

d. Continue to promote the use of conservation easements and other mechanisms for coastal resource management. One method of protecting land cover, land use and wildlife habitat short of acquisition is through the use of conservation easements. Under a conservation easement, the right to engage in specific activities is conveyed to a second party while the landowner retains ownership. The desirability of using easements may increase with the continued inflation of land values and the desire of some landowners to insure the natural setting of an area for future generations. Constitutional Amendment 543 provided for conservation easements in Alabama in 1993. This amendment specifically allows the state to accept such easements to protect natural areas. The Alabama legislature passed the Uniform Conservation Easement Act in 1997 as a means of specifying the methods and uses of conservation easements in the state. In partnership with ADCNR State Lands, the Reserve will pursue conservation easements where acquisition is not obtainable, and continue implementation of conservation easement education projects.

Weeks Bay Reserve

The Weeks Bay Reserve (Figure 9) encompasses those properties owned by the State of Alabama dedicated to the Reserve as described in the 1998 Management Plan. The Reserve includes the:

- water bottoms (submerged lands) up to the mean high tide line of Weeks Bay (1,730 acres)
- water bottoms of Fish and Magnolia Rivers, and their tributaries, to the mean high tide line and to the termination of tidal influence (534 acres)
- water bottoms of Bon Secour Bay adjacent to the Swift tract and north across the mouth of Weeks Bay opposite Mary Ann Beach Park to the mean high tide line (2,616 acres)
- Foley tract (178 acres)
- Ogburn tract (157 acres)
- Swift tract (615 acres)
- Damson tract (360 acres)
- View Point Park (2 acres)

Weeks Bay Reserve Boundary Expansion

The Reserve is seeking to expand its boundaries to encompass buffer properties currently owned by the State of Alabama but not included in the Reserve boundary (Figure 9). These lands are representative of the unique and valuable wetland habitats found in the Weeks Bay Coastal Area and include the:

- Fish River Marina tract (22 acres)
- Turkey Branch tract (20 acres)
- Harris tract (64 acres)
- Worcester tract (49 acres)
- Riverlands tract (90 acres)
- Safe Harbor (81 acres)
- Lott Property (3 acres)
- Meador tract (4 acres)

Weeks Bay Reserve Foundation

Two tracts of land are retained by the WBRF pending transfer to the Reserve. Upon title transfer and subsequent approval by NOAA, these tracts will, in the future, expand the area within the Reserve boundary by 23 acres.

- Juniper tract (13 acres)
- Bon Secour Bay tract (10 acres)

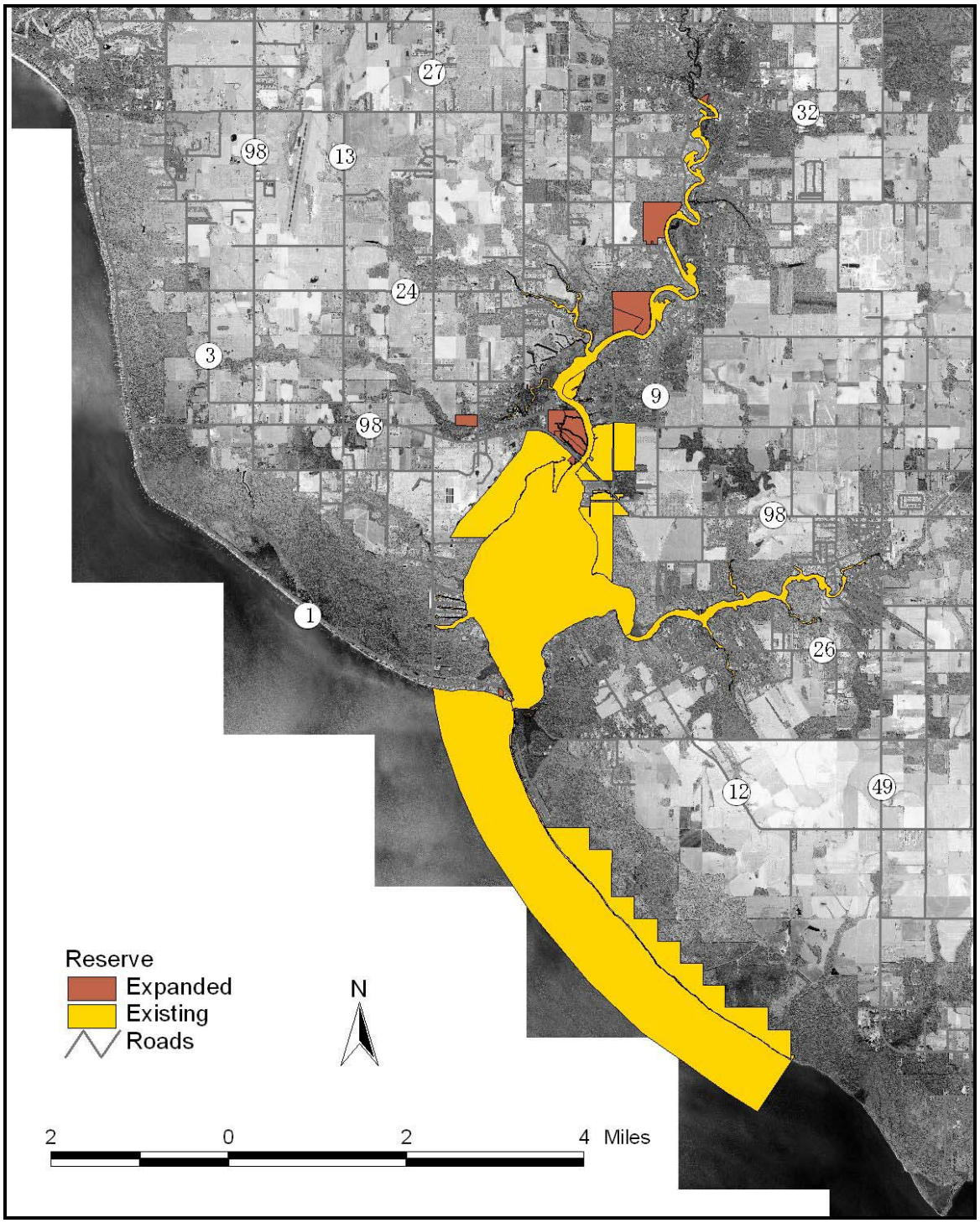

Figure 9. Existing and Expanded Reserve Boundaries.

PRIORITIZING LAND ACQUISITIONS

The land acquisition plan will be further developed with input from the Weeks Bay Advisory Committee and Weeks Bay Reserve Foundation. Future acquisitions of property will be based on several criteria including:

1. ecological importance - some properties may contain flora, fauna, or land forms of particular importance,

2. location - other factors being equal, property adjacent to existing holding would be preferred,

3. current use and development potential - undeveloped properties would generally be preferred but some developed parcels may be desirable to control the course of future development,

4. availability - currently for sale or likely to be for sale in the near future, and

5. cost and relative cost - availability of funds, possibility of a swap or donation, importance of the property relative to other parcels under consideration,.

Land Acquisition and Habitat Identification

There are five project areas that have been identified as containing significant ecological habitats.

Ecological characteristics that are considered significant in these five project areas are habitat type, rare/endangered species, breeding/nursery area, forage area, migratory species, geomorphic features, ecosystem function, and uniqueness of natural community. These characteristics are described below.

Habitat Type: In general, fresh and salt marshes, swamp and forested low-lying areas of sand and/or sandy/clay soils. Much is tidally influenced and wet year round.

Rare/Endangered species: American Bald Eagle, Pileated Woodpecker, Alabama Red-bellied Turtle, Gopher Tortoise, Indigo Snake, American Alligator, West Indian Manatee, and many bog plants that include those common to pitcher plant bogs (pitcher plants, sundew, etc.).

Breeding/Nursing Area: Weeks Bay is approximately 4 sq. miles, with *Ruppia* and *Vallisneria* SAV in many shoreline areas of the Bay. It is a prime nursery for shrimp and many other commercial and non-commercial fishes and crustaceans in both brackish and freshwater habitats.

Forage Area: Multitudes of species of mammals, reptiles, birds, amphibians, and fish. Dominated by swamp, and both freshwater and salt marshes.

Migratory Species: There are literally dozens, too many to name all, but include the white pelican, monarch butterfly, warblers, ducks, speckled trout, and others.

Geomorphic Features: Dominated by swamp and both salt and freshwater marshes. Primarily sand and clay soils, typical highly productive estuarine habitats.

Ecosystem Function: Food source, flood control, water quality protection and water purification, riparian habitat, groundwater recharge, wildlife habitat, nursery and spawning grounds.

Uniqueness of Natural Community: Exceptional biological productivity and diversity; migratory species (last stop and first arrival habitat for crossing the Gulf of Mexico); rare stands of Atlantic white cedar, pitcher plant bogs, cypress swamps.

These areas have been identified to contain significant tracts of land to be considered for potential acquisition (Figure 10). The five project areas are:

- Weeks Bay Project Area
- Magnolia River Project Area
- Lower Fish River Project Area
- Upper Fish River Project Area
- Bon Secour Bay Project Area

Existing designations within the five project areas include NERRS, ONRW, GEMS, GAPC, and ACAMP. The project areas lie within the rapidly growing northern Gulf coast. Land is available for commercial and residential uses, as well as for resource protection. Development and population growth pressures will no doubt stress the watershed. Threats to Weeks Bay watershed include urban, commercial, and residential development, sedimentation, nutrient influx, and pathogen contamination. These project areas are described below and are shown in Figures 11-15. Appendix J lists the definitions related to the National Wetland Inventory codes listed on the maps.

KEY PROJECT AREAS

Weeks Bay Project Area (Figure 11)

Weeks Bay is a shallow (4.8ft/1.6m), diamond-shaped estuary, having a surface area approximately 4 sq. miles (1.5mi E-W x 2.5mi N-S). Historically its entire perimeter is fringed with an emergent marsh of black needle rush (*Juncus roemarianus*) and saltmarsh cordgrass (*Spartina alterniflora*) predominantly. Close to the shore (10-20ft/3-7m) are bottomland hardwoods, with slash and loblolly pines (*Pinus elliotti, P. taeda*) and commonly seen bald and pond cypress (*Taxodium distichum, T. ascendens*).

With slight elevation, the encompassing forested wetlands include such common tree species as live, water, and chestnut oaks (*Quercus virginiana, Q. nigra, Q. prinus*), sweetgum (*Liquidambar styraciflua*), blackgum (*Nyssa sylvatica*), red cedar (*Juniperus virginiana*), red and silver maples (*Acer rubrum, A. saccharinum*), American, yaupon, and dahoon hollies (*Ilex opaca, I. vomitoria, I. cassine*), and southern and sweet bay magnolias (*Magnolia grandiflora, M. virginiana*), just to name a few. These habitats still exist on the northern half of the Bay on both east and west sides, primarily already within the NERRS boundary. The south half of the Bay has been developed in many areas, yet much of the emergent and swamp areas still exist.

Magnolia River Project Area (Figure 12)

Magnolia River, though sporadically developed along much of the river, has large tracts of undisturbed fresh and brackish habitats that need protection. Much of these areas are emergent saltmarsh and emergent freshwater marsh, with tidal and non-tidal swamp and lowland areas. Including the species mentioned above, other dominant species in this project area include common reed (*Phragmites australis*), sawgrass (*Cladium jamaicense*), cattails (*Typha sp.*), arrow arum (*Peltandra virginica*), wild rice (*Zizania aquatica*), pickerelweed (*Pontederia cordata*), bulrushes (*Scirpus sp.*) and tapegrass (*Vallisneria americana*) to name a few. These habitats are of particular value for nursery areas and as flood control during the regions frequent hurricanes and storms. The north Gulf coast has the highest rainfall (avg. 65 inches) of anywhere in the continental United States.

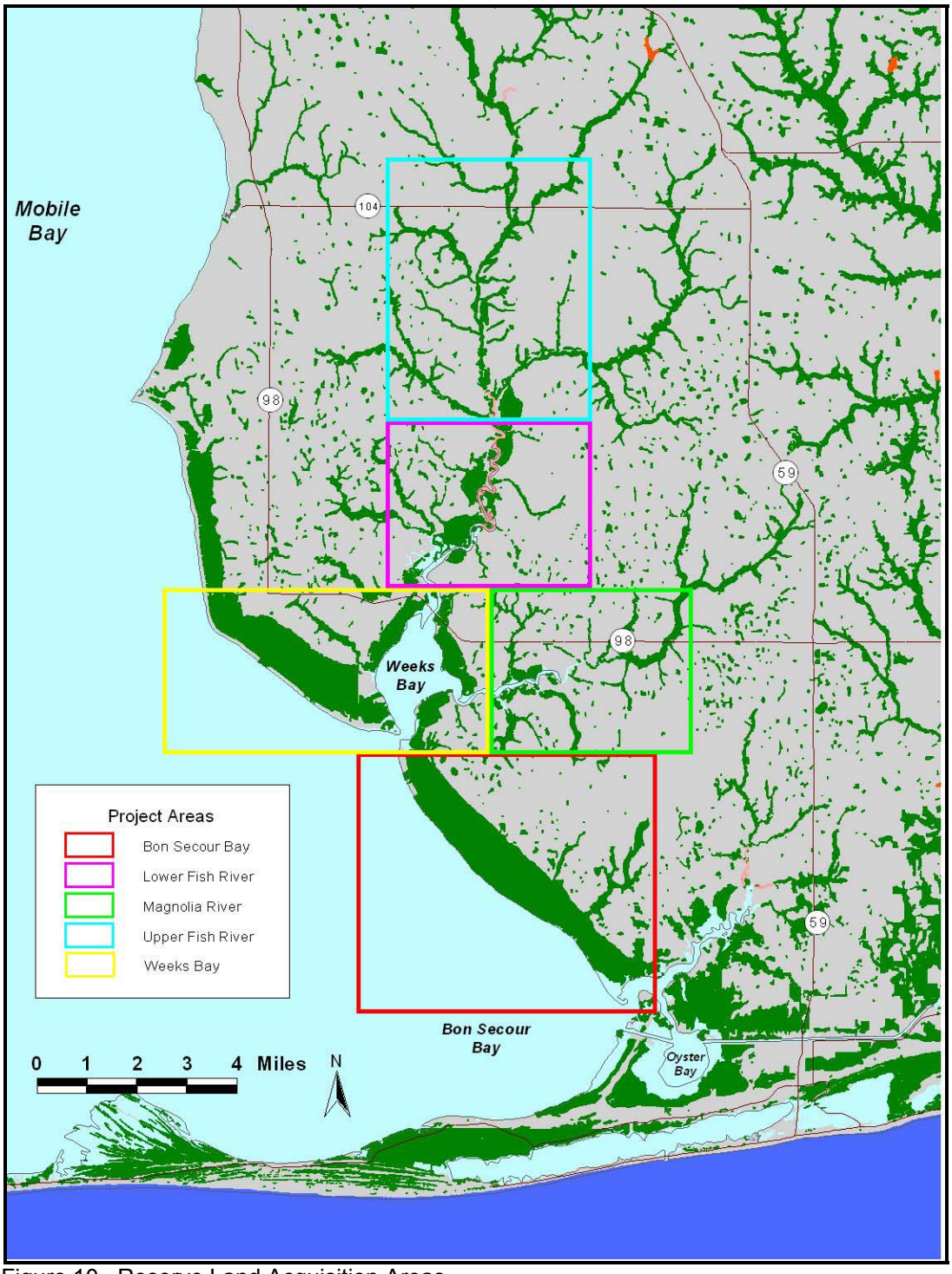

Figure 10. Reserve Land Acquisition Areas.

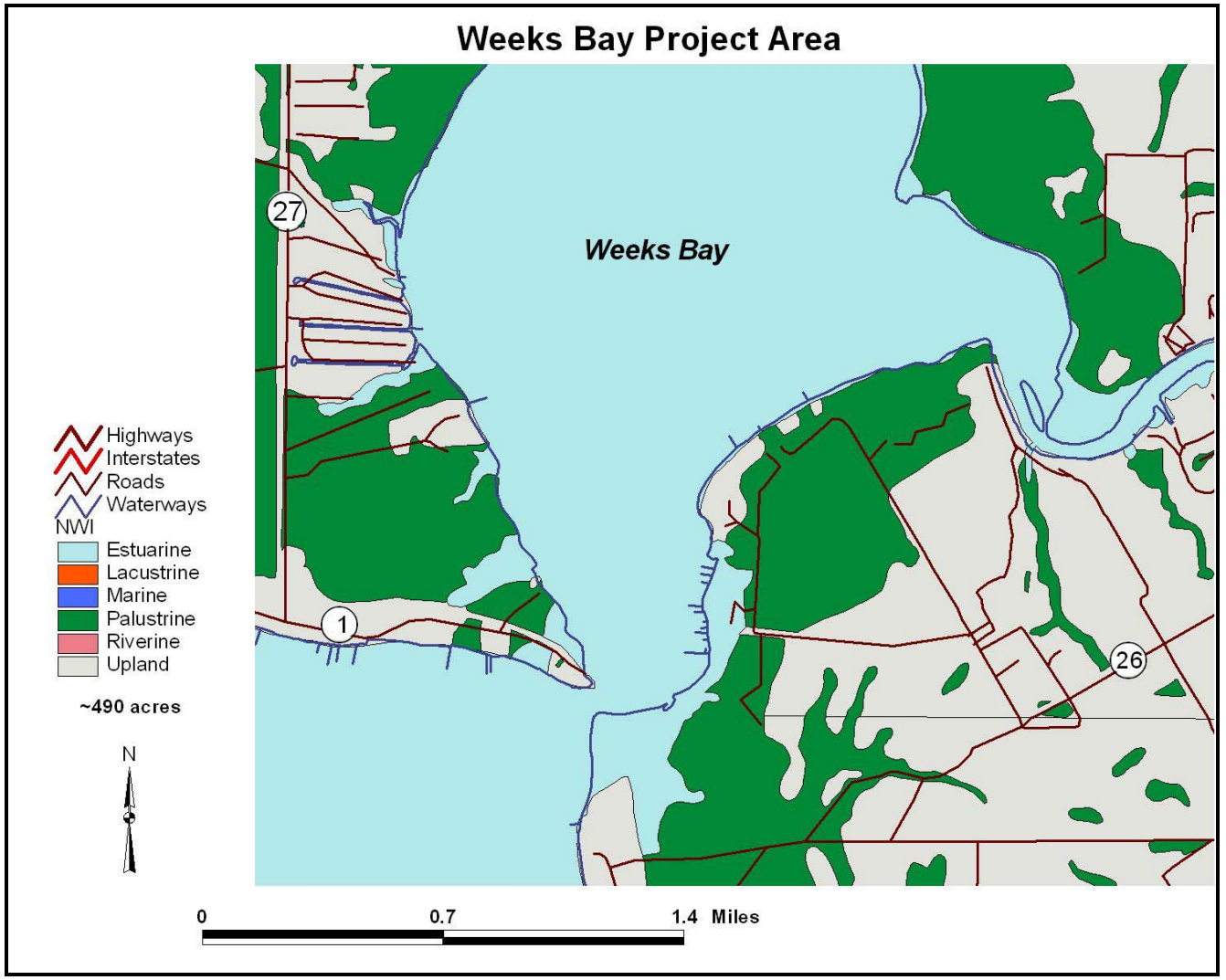

Figure 11. Weeks Bay Project Area.

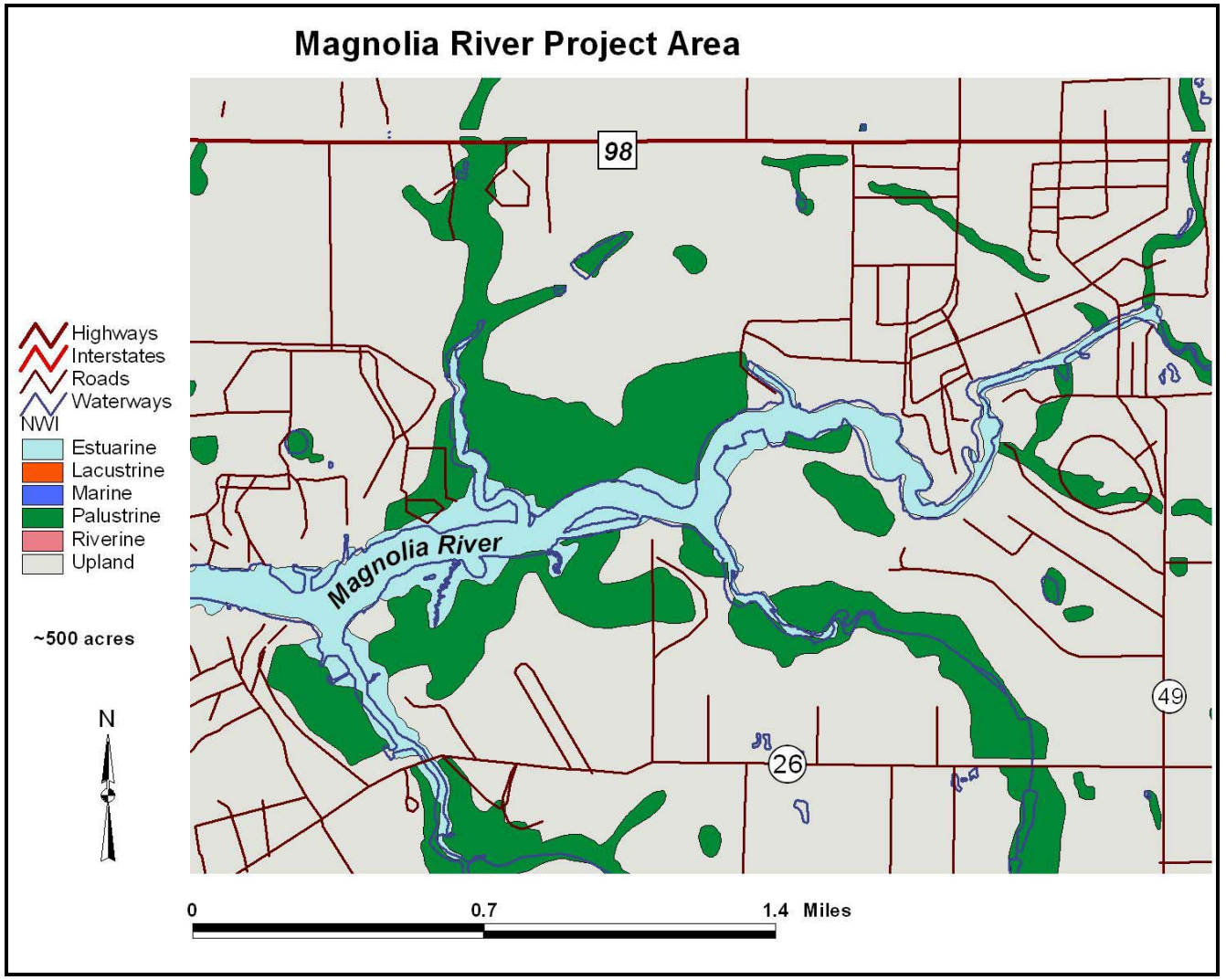

Figure 12 . Magnolia River Project Area.

Lower Fish River Project Area (Figure 13)

The larger of the two rivers, providing 74% of water volume entering Weeks Bay, the Fish River is more developed, with permanent and summer homes along approximately 1/3 of its shoreline. Sections of the River are undisturbed, lining both riverbanks with tidal and non-tidal swamps and emergent freshwater marshes with species previously mentioned. Some upland areas are in agriculture. Many of the Fish River's tributaries are relatively remote and untouched.

Upper Fish River Project Area (Figure 14)

The upper reaches of the Fish River are more remote; mostly forested, and are less populated compared with the lower half of the River. Yet, due to intense population growth more of this forest and cropland is being turned into housing subdivisions with on-site septic treatment. There have been two identified stands of rare and unique Atlantic White Cedar swamp/forest in the upper Fish River. These areas represent a distinct community not currently protected. Several rare plants are documented here including pitcher plant species, and gopher tortoises noted in the uplands. There are a few large areas of saltmarsh near the mouths of Weeks Bay, Fish River, and Magnolia River that should be acquired.

Bon Secour Bay Project Area (Figure 15)

Part of the Reserve lies outside of the Weeks Bay watershed to the south, with land and water bottom on Mobile Bay. These unprotected habitats, primarily swamp forest of cypress, oak, and pine, are adjacent and near to Reserve property, and currently accessible only by water. Development pressures inland may open up some of these parcels for shore development. Reserve lands in this project area have recently received a controlled burn, in efforts to restore a more historical pine-savannah habitat.

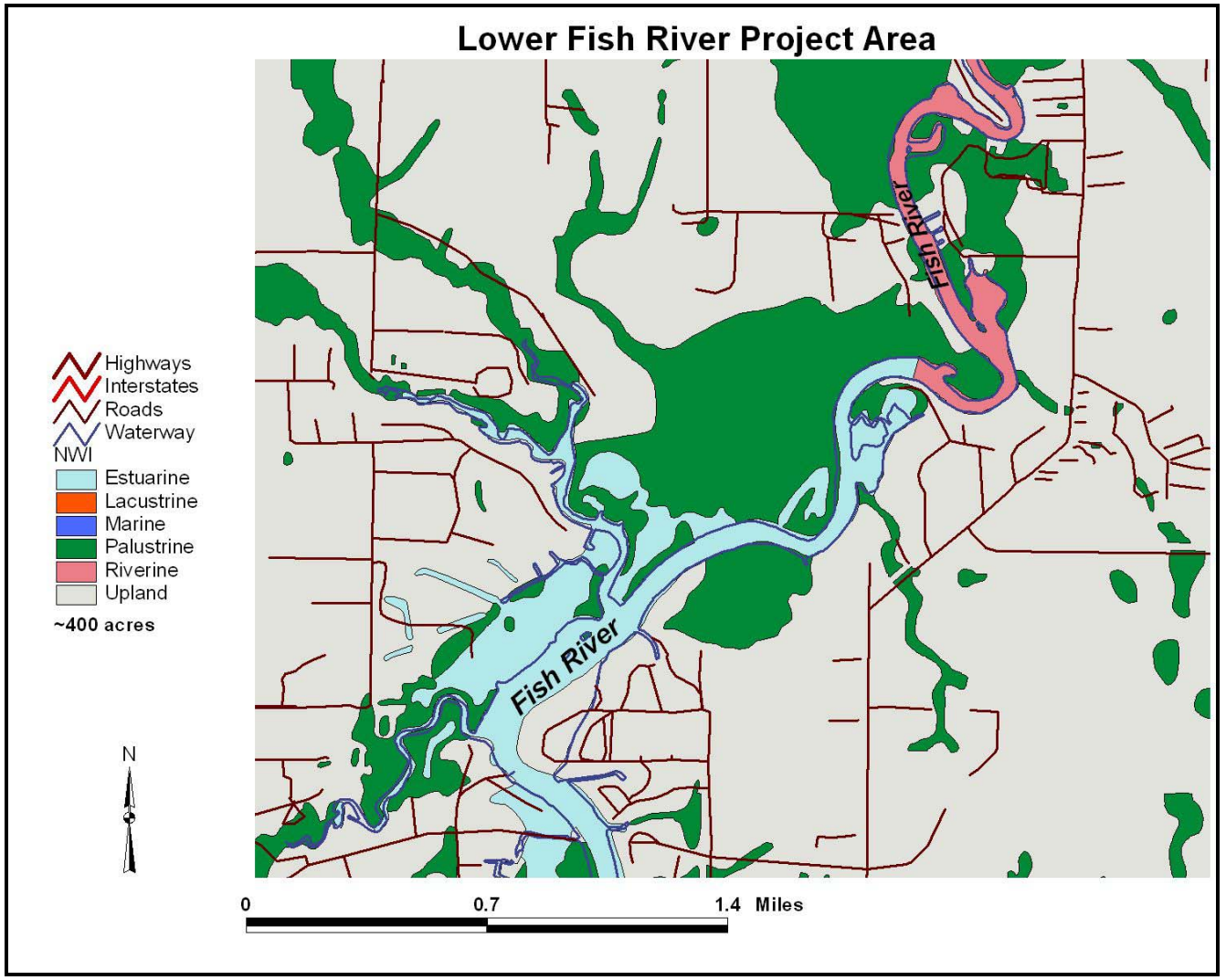

Figure 13. Lower Fish River Project Area

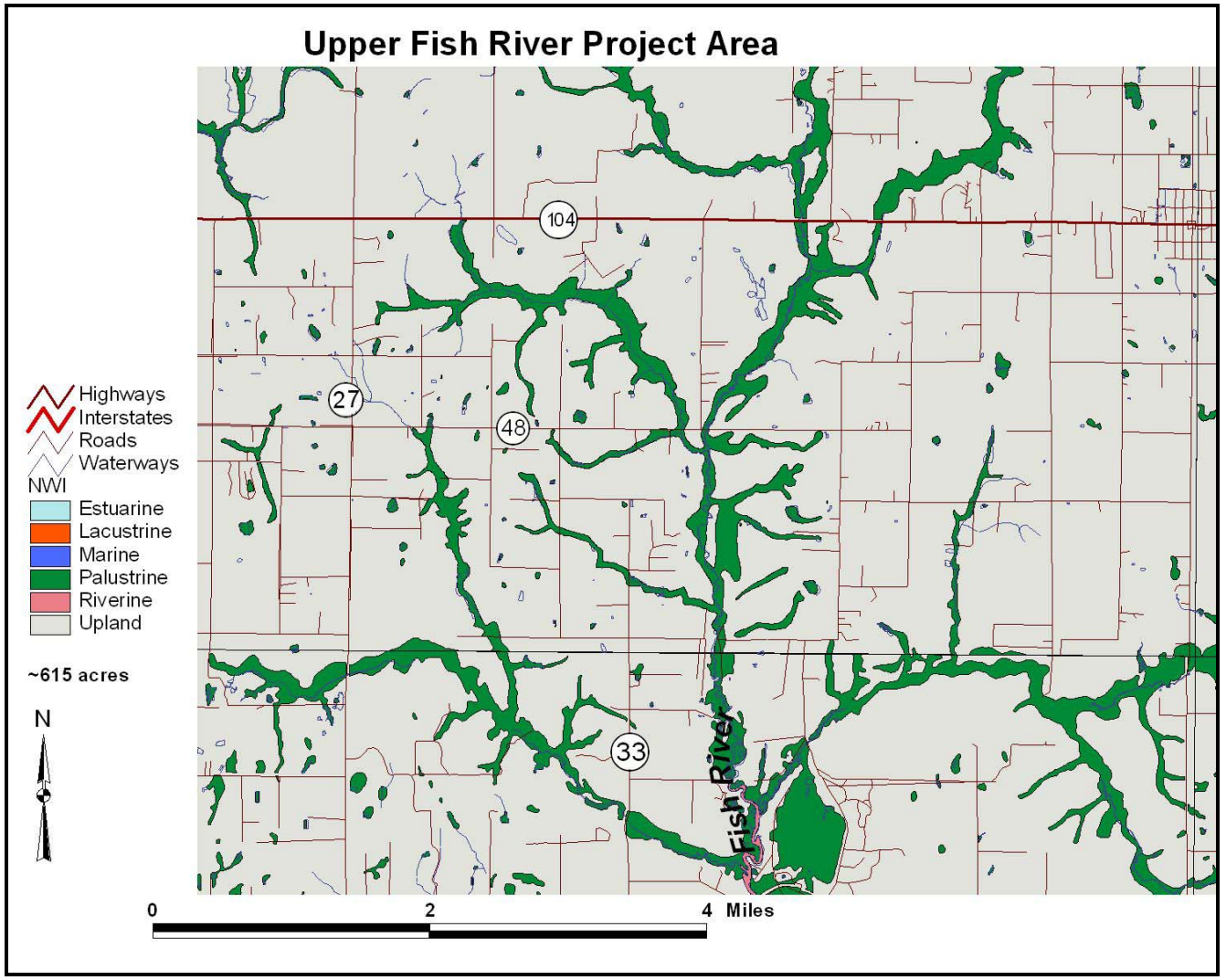

Figure 14. Upper Fish River Project Area.

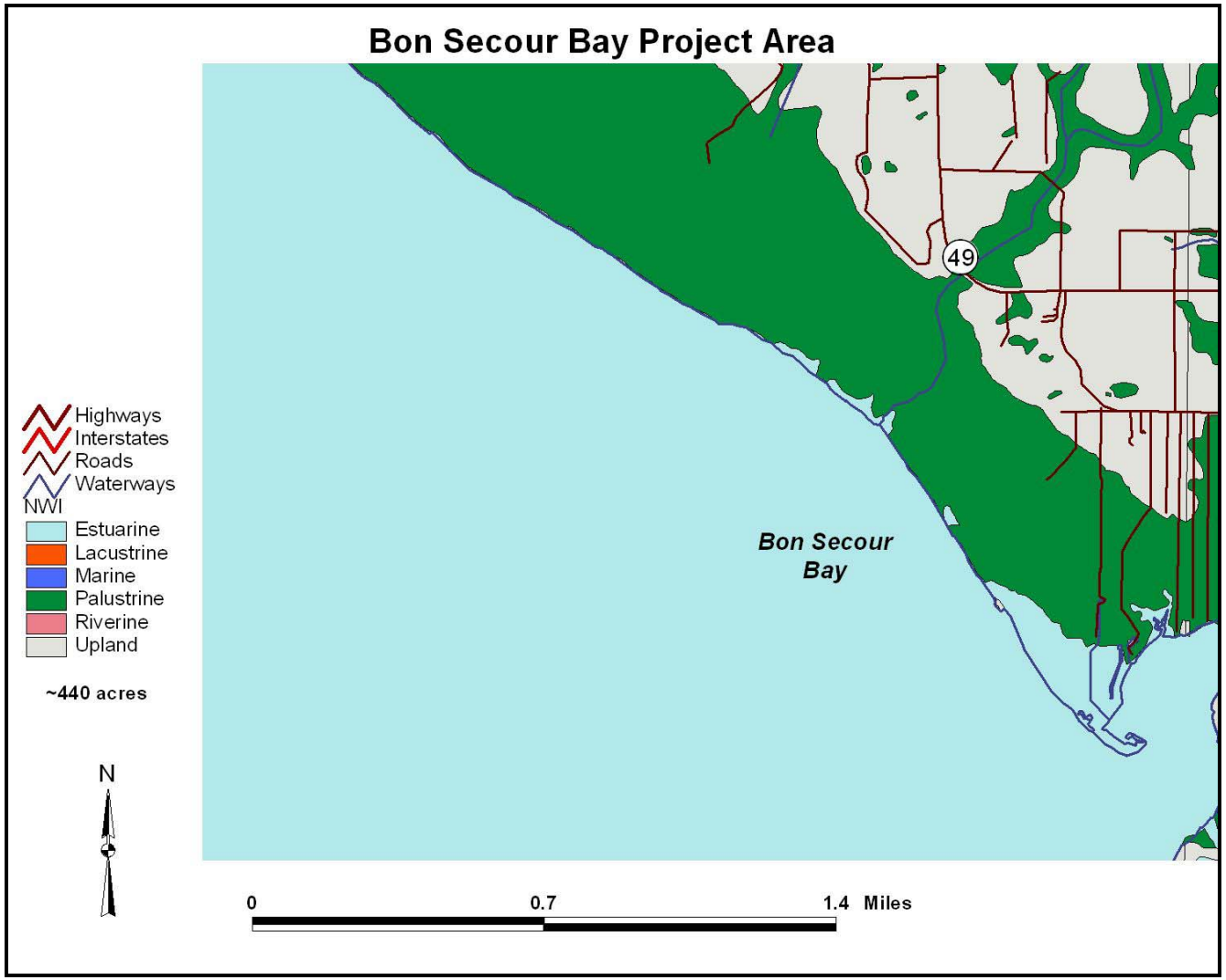

Figure 15. Bon Secour Bay Project Area.

VI. PUBLIC ACCESS PLAN

Providing public access to the Reserve for educational and recreational activities for the public is essential for promoting public support and stewardship. When individuals visit the Interpretive Center or hike the trails, they have an opportunity to gain a better appreciation for the natural beauty, intricacies and value of coastal habitats. The Interpretive Center also provides visitors with information on specific habitats, and resource conservation. Weeks Bay Reserve serves as a focal point for education and outreach and provides the public with opportunities to experience and enjoy nature. The Reserve is ideally situated for education and outreach activities by virtue of its accessibility.

The goals, objectives, and actions of the Public Access Plan are:

Goal: Protect and improve habitat and biological diversity within the boundary of the Reserve.

Objective: Designate areas and guidelines for public access to reduce impact on resources and maximize public outreach.

Actions:

a. Utilize boardwalks and other low impact access to unique habitats.

b. Provide public with information describing resource protection. At each entry point to Reserve properties, both interpretive and resource protective materials are provided and will continue to be developed. Specifically, these provide the public with information regarding policies and how to reduce adverse impacts and protect the resources.

c. Provide trail guides with interpretive information.

Goal: Promote education, stewardship, and scientific research focusing on estuarine ecosystems.

Objective: Improve and enhance water access to facilitate Reserve programs.

Action:

a. Focus public access to designated areas of the Reserve adding the access points listed below:

Interpretive Center Ground Trail/Observation Area
Interpretive Center/Docking Facility Boardwalk
Weeks Bay Coastal Bike/Hike Trailhead

VII. FACILITIES AND CONSTRUCTION PLAN

Administrative offices are located in a 4,500 square foot Interpretive Center located on U.S. Highway 98. This building also includes a small classroom, small laboratory, conference room, exhibit area including live animals, restrooms, and storage space. Directly behind the center, is a 3,600 linear ft. elevated boardwalk. In August 1996, a 16 x 20 foot portion of the observation deck was covered with a pavilion to provide shelter for visitors. A second elevated boardwalk at the Weeks Bay Pitcher Plant Bog provides access to citizens who are interested in visiting the carnivorous plant bog. The overlook/observation area is handicapped accessible from a parking lot provided by Baldwin County. Construction of a 3,500 square foot Research & Education Facility was completed in 1997. This facility provides housing for visiting researchers, an auditorium for educational programs, and additional office space.

At present, existing facilities are at capacity. Increased facilities for instruction will allow Reserve programs to meet increased demand for services. The CTP has moved into an operational phase and workshop size may need to be increased. Educational programs for grades K-12 are at a maximum level limited in part by facilities. Facilitation of visiting researchers continues to increase and creative scheduling is sometimes the only solution to potential conflicts in the use of facilities and assets.

The goals, objectives, and actions of the Facilities and Construction Plan are:

Goal: Promote education, stewardship, and scientific research focusing on estuarine ecosystems.

Objective: Develop buildings that have a low impact on natural resources within the Reserve.

Actions:

a. Expand boardwalk to connect with the nature trail and provide observation area.

b. Expand parking areas and construct second access to Highway 98 utilizing innovative surfacing where possible.

c. Develop flow through aquatic systems for research and educational/interpretive programs.

d. Expand boardwalk to connect Interpretive center with Weeks Bay Docking Facility

e. Establish an outside restroom facility for school groups.

f. Maintain and update Interpretive Exhibits.

g. Expand classroom and restroom facilities for education programs.

h. Refurbish parking areas utilizing innovative surfacing where possible.

i. Construct or convert existing space to provide a lab area for research and monitoring.

j. Construct or convert existing space to provide outdoor education facilities.

k. Rebuild or refurbish permanent buildings such as the Volunteer Activities Center.

l. Develop and Implement Facility Master Plan Study and Design with reference to the Weeks Bay Reserve Long Range Plan (Appendix L).

m. Construct maintenance and storage facility on site.

n. Construct dormitory to house visiting researchers.

Objective: Existing resources will be improved and enhanced to better accommodate Reserve Programs.

Actions:

a. Acquire a covered pontoon boat with twin engines and the capacity to carry 40 passengers.

b. Acquire an open water work boat with engine.

c. Acquire a vehicle with the capacity to tow and a 4x4 maintenance vehicle.

d. Refurbish dockage on Fish River, and canal north of the US 98 bridge.

e. Rebuild boat house areas on center canal, Fish River, and canals of Safe Harbor.

f. Establish interpretive canoe trails and offer canoe checkout for the public.

g. Replace boat ramp at Safe Harbor.

h. Maintain ponds at Safe Harbor for education and research programs.

VIII. RESEARCH AND MONITORING PLAN

The reserve system provides a mechanism for addressing scientific and technical aspects of coastal management problems through a comprehensive, interdisciplinary, and coordinated approach. Research and monitoring programs, including the development of baseline information, form the basis of this approach. Reserve research and monitoring activities are guided by national plans that identify goals, priorities, and implementation strategies for these programs. This approach, when used in combination with the education and outreach programs, will help ensure the availability of scientific information that has long-term, system-wide consistency. The approach has utility for managers and members of the public to use in protecting or improving natural processes in their estuaries.

Reserve System Research Goals

Research at the Weeks Bay National Estuarine Research Reserve is designed to fulfill the NERR System goals as defined in program regulations. These include:

- Address coastal management issues identified as significant through coordinated estuarine research within the System.

- Promote Federal, state, public and private use of one or more reserves within the System when such entities conduct estuarine research; and

- Conduct and coordinate estuarine research within the System, gathering and making available information necessary for improved understanding and management of estuarine areas.

Reserve System Research Funding Priorities

Federal regulations, 15 C.F.R. Part 921.50 (a), specify the purposes for which research funds are to be used:

- Support management-related research that will enhance scientific understanding of the Reserve ecosystem,
- Provide information needed by Reserve managers and coastal ecosystem policy-makers, and
- Improve public awareness and understanding of estuarine ecosystems and estuarine management issues.

The reserve system is focusing on the following research areas to support the priorities above:

1. Eutrophication, effects of non-point source pollution and/or nutrient dynamics;
2. Habitat conservation and/or restoration;
3. Biological diversity and/or the effects of invasive species;
4. Mechanisms for sustaining resources within estuarine ecosystems; or
5. Economic, sociological, and/or anthropological research applicable to estuarine ecosystem management

There are two reserve system efforts to fund research on the previously described areas. The Graduate Research Fellowship Program (GRF) supports students to produce high quality research in the reserves. The fellowship provides graduate students with funding for 1-3 years to conduct their research, as well as an opportunity to assist with the research and monitoring program at a reserve.

Projects must address coastal management issues identified as having regional or national significance; relate them to the reserve system research focus areas; and be conducted at least partially within one or more designated reserve sites.

Students work with the research coordinator or manager at the host reserve to develop a plan to participate in the reserve's research and/or monitoring program. Students are asked to provide up to 15 hours per week of research and/or monitoring assistance to the reserve; this training may take place throughout the school year or may be concentrated during a specific season.

Secondly, research at the NEERS is funded through the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET), a partnership between NOAA and the University of New Hampshire. CICEET uses the capabilities of UNH, the private sector, academic and public research institutions throughout the U.S., as well as the 27 reserves in the reserve system, to develop new environmental technologies and techniques.

System-Wide Monitoring Program

It is the policy of the Weeks Bay Reserve to implement each phase of the System-Wide Monitoring Plan initiated by ERD in 1998, and as outlined in the reserve system regulations and strategic plan:

- Phase I: Environmental Characterization, including studies necessary for inventory and comprehensive site descriptions;
- Phase II: Site Profile, to include a synthesis of data and information; and
- Phase III: Implementation of the System-Wide Monitoring Program.

The System-wide Monitoring Program provides standardized data on national estuarine environmental trends while allowing the flexibility to assess coastal management issues of regional or local concern. The principal mission of the monitoring program is to develop quantitative measurements of short-term variability and long-term changes in the integrity and biological diversity of representative estuarine ecosystems and coastal watersheds for the purposes of contributing to effective coastal zone management. The program is designed to enhance the value and vision of the reserves as a system of national reference sites. The program currently has three main components and the first is in operation.

1. Abiotic Variables: The monitoring program currently measures pH, conductivity, salinity, temperature, dissolved oxygen, turbidity, water level and atmospheric conditions. In addition, the program collects monthly nutrient and chlorophyll a samples and monthly diel samples at one SWMP data logger station. Each reserve uses a set of automated instruments and weather stations to collect these data for submission to a centralized data management office.
2. Biotic Variables: The reserve system has successfully incorporated SAV/Emergent Biomonitoring efforts within 18 reserves. Other aspects that could be incorporated include monitoring infaunal benthic, nekton and plankton communities.
3. Landuse, Habitat Mapping and Change: This component will be implementing the NERRS Habitat Classification System to identify changes in coastal ecological conditions with the goal of tracking and evaluating changes in coastal habitats and watershed land use/cover. The main objective of this element will be to examine the links between watershed land use activities and coastal habitat quality.

These data are compiled electronically at a central data management "hub," the Centralized Data Management Office (CDMO) at the Belle W. Baruch Institute for Marine Biology and Coastal Research at the University of South Carolina. They provide additional quality control for data and metadata and they compile and disseminate the data and summary statistics via the Web (http:/cdmo.baruch.sc.edu) where researchers, coastal managers and educators readily access the information. The metadata meets the standards of the Federal Geographical Data Committee.

Research Plan

The goals, objectives, and actions of the Research Plan are:

Goal: Promote education, stewardship, and scientific research focusing on estuarine ecosystems.

Objective: Provide resources, support, and background data to independent research projects within the Reserve and adjacent associated waters.

Actions:

a. Evaluate research proposals for consistency with Reserve goals and to ensure that the proposed research will not interfere with other research at the Reserve.

b. Information and data housed at the Reserve will be provided to researchers if requested to assist research, including maps, species lists, charts, access to reserve boats, field gear, lodging, computers, laboratory, equipment, etc.

c. A Reserve staff person shall pilot all Reserve vessels unless researchers are qualified, licensed vessel operators, knowledgeable in proper small boat handling and safety, and receive prior permission.

d. Establish and maintain monitoring site in Bon Secour Bay.

Objective: Increase understanding of watershed functions and methods of resource protection and restoration through applied research and monitoring projects.

Actions:

a. Establish a priority list of applied research and monitoring themes consistent with the goals of the Reserve.

b. Use priority list to seek outside research and monitoring or to initiate internal applied research and monitoring projects.

c. Establish and implement procedures using scientifically accepted or standard methods to monitor and collect the appropriate data from applied research and monitoring projects conducted at the Reserve.

d. Continue to cooperate with appropriate federal, state, and local agencies and watershed stakeholders to address federally listed impaired waterways and to establishment Total Maximum Daily Load implementation plans.

Goal: Improve decisions affecting estuarine and coastal resources.

Objective: Make baseline data on habitats and water quality available to local, state, and national entities.

Actions:

a. Create and update numerical databases that include information on habitats and water quality available to entities outside of the Reserve.

b. Create and update georeferenced data layers based on habitat and water quality data sets.

c. Incorporate data collected through System-wide Monitoring Program into site specific GIS format.

d. Ensure adequate training in GIS for the Reserve Staff.

e. Create products for various user groups

Monitoring Plan

The goals, objectives, and strategies of the Monitoring Plan are:

Goal: Improve decisions affecting estuarine and coastal resources.

Objective: Monitoring and research data will be translated and disseminated to local, state, and federal participating agencies and other private and public users through education and outreach programs.

Actions:

a. Establish and host research forums open to coastal resource managers and the general public with active researchers presenting quality assured or peer-reviewed data from research and monitoring projects.

b. Continue to publish articles in local media and newsletters outlining research and monitoring activities.

c. Continue to present research and monitoring data at professional meetings or other appropriate public events.

IX. EDUCATION PLAN

The reserve system provides a vehicle to increase understanding and awareness of estuarine systems and improve decision-making among key audiences to promote stewardship of the nation's coastal resources. Education and interpretation in the reserves incorporates a range of programs and methodologies that are systematically tailored to key audiences around priority coastal resource issues and incorporate science-based content. Reserve staff members work with local communities and regional groups to address coastal resource management issues, such as non-point source pollution, habitat restoration and invasive species. Through integrated research and education programs, the reserves help communities develop strategies to deal successfully with these coastal resource issues.

Formal and non-formal education and training programs in the NERRS target K-12 students, teachers, university and college students and faculty, as well as coastal decision-maker audiences such as environmental groups, professionals involved in coastal resource management, municipal and county zoning boards, planners, elected officials, landscapers, eco-tour operators, and professional associations.

K-12 EDUCATION

K-12 and professional development programs for teachers include the use of established coastal and estuarine science curricula aligned with state and national science education standards and frequently involves both on-site and in-school follow-up activity. Reserve education activities are guided by national plans that identify goals, priorities, and implementation strategies for these programs. Education and training programs, interpretive exhibits and community outreach programs integrate elements of NERRS science, research, and monitoring activities and ensure a systematic, multi-faceted, and locally focused approach to fostering stewardship.

RESERVE SYSTEM EDUCATION MISSION AND GOALS

The National Estuarine Research Reserve System's mission includes an emphasis on education, interpretation, and outreach. Education policy at the Weeks Bay Reserve is designed to fulfill the reserve system goals as defined in the regulations (15 C.F.R. Part 921(b). Education goals include:

- Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;

- Conduct and coordinate estuarine research within the system, gathering and making available information necessary for improved understanding and management of estuarine areas.

RESERVE SYSTEM EDUCATION OBJECTIVES

Education-related objectives in the Reserve System Strategic Plan (FY 05-10) include:

- People are aware of the ecological, economic, historical, and cultural importance of estuarine resources.

- People understand how human choices and natural disturbances impact social, economic, and estuarine ecological systems.

- People apply science-based information when making decisions that could impact coastal and estuarine resources.

RESERVE SYSTEM COASTAL TRAINING PROGRAM

The Coastal Training Program (CTP) provides up-to-date scientific information and skill-building opportunities to coastal decision-makers who are responsible for making decisions that affect coastal resources. Through this program, National Estuarine Research Reserves can ensure that coastal decision-makers have the knowledge and tools they need to address critical resource management issues of concern to local communities.

Coastal Training Programs offered by Reserves relate to coastal habitat conservation and restoration, biological diversity, water quality, and sustainable resource management and integrate reserve-based research, monitoring, and stewardship activities. Programs target a range of audiences, such as land-use planners, elected officials, regulators, land developers, community groups, environmental non-profits, business and applied scientific groups. These training programs provide opportunities for professionals to network across disciplines, and develop new collaborative relationships to solve complex environmental problems. Additionally, the CTP provides a critical feedback loop to ensure that professional audiences inform local and regional science and research agendas. Programs are developed in a variety of formats ranging from seminars, hands-on skill training, participatory workshops, lectures, and technology demonstrations. Participants benefit from opportunities to share experiences and network in a multidisciplinary setting, often with a reserve-based field activity.

Partnerships are important to the success of the program. Reserves work closely with State Coastal Programs, Sea Grant College extension and education staff, and a host of local partners in determining key coastal resource issues to address, as well as the identification of target audiences. Partnerships with local agencies and organizations are critical in the exchange and sharing of expertise and resources to deliver relevant and accessible training programs that meet the needs specific groups.

The Coastal Training Program requires a systematic program development process, involving periodic review of the reserve niche in the training provider market, audience assessments, development of a three-five year program strategy, a marketing plan and the establishment of an advisory group for guidance, program review and perspective in program development. The Coastal Training Program implements a performance monitoring system, wherein staff report data in operations progress reports according to a suite of performance indicators related to increases in participant understanding, applications of learning and enhanced networking with peers and experts to inform programs.

PROGRAM STRATEGIES

The Reserve Education Plan designs and implements comprehensive programs of education and interpretation based on natural history, applied and cultural research efforts to strengthen understanding, appreciation and stewardship of estuaries, coastal habitats, and associated watersheds.

The goals, objectives, and actions for the Education Plan are as follows:

Goal: Protect and improve habitat and biological diversity within the boundary of the Reserve.

Objective: Provide resources to maintain, develop and implement educational programs.

Actions:

a. Employ a Coastal Training Program Coordinator.

b. Employ an assistant to help with K-12 educational programs and summer activities.

c. Keep computers, software, and other technological equipment updated.

d. Provide opportunities for the Reserve education staff to attend professional development programs and training.

Goal: Improve decisions affecting estuarine and coastal resources.

Objective: Use the training and outreach center for the capacity building of coastal resource managers.

Actions:

a. Develop an interactive website in which training sessions can be advertised; participants may register on-line for the events, and complete some post-venue evaluations. Additionally, the website will host a regional Master Calendar of natural resource training events and have a page with links to other training providers, partners, and issues of related interest.

b. Produce a CTP brochure that describes the goals, objectives, and details of potential training activities and update the brochure as the program progresses through the development phases.

c. Develop an inventory of prepared programs and informational documents.

d. Acquire equipment and supplies to enable the dissemination of the best science based information to decision makers.

Goal: Promote education, stewardship, and scientific research focusing on estuarine ecosystems.

Objective: Develop and implement comprehensive education and interpretation programs to increase knowledge of target audiences.

Actions:

a. Revise and supplement the K-12 curriculum incorporating new knowledge and technology. Develop the Weeks Bay Reserve portion of the ADCNR website to allow the public to access information concerning estuarine habitats of Alabama. The Reserve will continue to partner with the Weeks Bay Reserve Foundation to maintain a website as an educational reference tool.

b. Design interpretive materials and exhibits which communicate the significance of Reserve habitats and encourage stewardship of these areas and disseminate information to the public.

c. Develop and update brochures and interpretive guides for trails as needed.
The Education Program will develop interpretive materials that best suit the Reserve community and the National program. Educational materials will be revised periodically and new materials will be developed to meet the changing needs of our audiences

d. Provide forums for people of all ages to become directly involved in stewardship activities through personal and community actions. The Reserve education staff will continue to train Reserve volunteers on environmental issues and techniques

necessary to interact with the public, participate in research and monitoring programs and increase personal knowledge and skills

Objective: Develop needs assessments and multi-purpose evaluation tools to measure effectiveness of education programs.

Actions:

a. Utilize assessments and tools to survey target audiences to measure the effectiveness of the education/interpretive programs. Presently the K-12 program assessment and evaluation consists of post visit questionnaires that are distributed to teachers. The questionnaire asks teachers to evaluate the value and effectiveness of present programs and to make suggestions concerning new programs that they would like to see implemented in the future.

b. Participants in CTP trainings will complete evaluations as measurements of the program success.

X. VOLUNTEER PLAN

Volunteers make a tremendous contribution to all facets of Reserve programs. By supplementing the efforts of the paid staff, they expand and enhance the Reserve's goals and objectives. The Reserve is fortunate to be able to draw from a retirement community with a wide variety of skills and expertise. The volunteers gain personal satisfaction from the knowledge that they are performing an important role in protecting our estuarine and coastal resources. An effective volunteer program is an asset to the Reserve, a valuable experience for the volunteer, and an opportunity for direct community involvement. A volunteer program is also one of the best ways to effectively transfer information on the value of estuaries to the general public and to elected officials. Properly trained volunteers carry their knowledge and enthusiasm to portions of the general public that the Reserve staff may not reach.

The active participation of citizens in the community best serves the goals of the Reserve. Volunteers are encouraged to participate in all programs and activities and serve at all levels of skill and decision making. Commitment to having effective volunteer involvement is demonstrated by giving the volunteer program priority. It is the belief of the staff of the Reserve that there is a direct correlation between the quality of attention given to volunteers and the quality of their contribution.

The entire Reserve staff, from administration to maintenance, will demonstrate faith, respect, and enthusiasm for the volunteer program. The Reserve commitment to welcoming community involvement will be evident at all times, demonstrating a philosophy that volunteers are an integral part of the Reserve. The Volunteer Program will provide volunteer orientation, education, and development. It will also provide educational outreach to the community in order to develop a fundamental understanding of estuaries and how these areas are impacted by human activity.

The goals, objectives, and actions of the Volunteer Plan are:

Goal: Improve decisions affecting estuarine and coastal resources.

Objective: Trained volunteers will transfer knowledge and enthusiasm to wider audiences.

Actions:

a. Develop recruitment and media relations materials.

b. Encourage public speaking and personal contacts.

c. Manage recruitment efforts. This will entail designing materials which might include: a range of flyers, posters, brochures, etc.; written public service announcements to broadcast on radio and television; and press releases submitted to appropriate public sites, including print media, electronic networks and bulletin boards. Other projects that could be developed are slide shows and other audio-visual materials to support presentations and creation of a traveling exhibit/ display highlighting the volunteer program. Another mechanism to attract volunteers is to encourage public speaking and personal contacts among existing volunteers and develop a core of "program representatives" trained to speak on behalf of the volunteer program. Opportunities will also be registered with referral sources such as Volunteer Centers and the Coordinator will work with staff to insure all Weeks Bay Reserve public relations include mention of volunteer opportunities.

d. Continue to develop and refine orientation program for all volunteers.

e. Continue to develop and refine initial training plan.

f. Revise manuals and handbooks to be used for volunteer orientation and training.

Goal: Promote education, stewardship, and scientific research focusing on estuarine ecosystems.

Objective: Reserve will utilize volunteers to enhance and expand programs.

Actions:

a. Identify the Reserve's need for assistance. To assist Reserve programs, the Volunteer Plan will identify the Reserve's needs. Interviews will be conducted with the Reserve manager, staff, and volunteers to determine areas where assistance is needed. This information will be compiled and organized to aid in program development. The program will also research models of other volunteer programs to see how their successes can be incorporated

b. Develop a team approach for volunteer involvement in the Reserve. The program will develop and implement a team approach for volunteer involvement in the Reserve. This will entail identifying the main areas for volunteer involvement, creating job descriptions for each of the identified areas known as "support teams" A letter will be mailed to the volunteers explaining this team approach along with a response form indicating the level of involvement to which each volunteer agrees. Teams will then be formed and their activities will be coordinated through the volunteer coordinator to best assist the needs of the Reserve. Additional training will be provided to each team as needed.

c. Develop new volunteer projects.

d. Coordinate volunteer assignments and schedules. Specifically, the Volunteer Coordinator will work with staff to develop volunteer job descriptions and review job descriptions periodically and revise as necessary. The Volunteer Coordinator, in cooperation with volunteers and staff, will plan overall work schedules for volunteer assignments and document volunteer service.

Objective: Provide opportunities for volunteers to be involved with education, stewardship, and research programs.

Actions:

a. The Weeks Bay Volunteers will be organized into support teams. The Volunteer Coordinator will communicate regularly with members of the staff who directly supervise volunteers. This will ensure that volunteers are utilized appropriately with tasks suited to their abilities. It will also ensure that staff is accessible to, and is maintaining regular supervisory contact with, volunteers assigned to them. The coordinator will also function as a liaison and serve as a moderator to resolve any problems arising between volunteers and staff members, or among volunteers themselves.

b. Create and manage annual funding for the volunteer program.

c. Provide volunteers with adequate Reserve support for their program needs.

d. Monitor the supervision of the volunteers and act as an advocate for the volunteers. The Weeks Bay Volunteers organization will develop risk management procedures and strategies to understand legal and insurance issues as they relate to volunteers,

identify specific areas of potential risks and develop policies, training, and other strategies to limit such risks. They will also review the Reserve's policies and procedures, consult with the Reserve Manager and staff about any requirements and rules affecting volunteers. The Organization will determine annual budget needs and convey them to the Reserve Manager, authorize budget expenditures, develop a procedure for reimbursing volunteers and any other necessary fiscal procedures, and plan and implement fund raising events for the volunteer program.

The Volunteer Coordinator will act as an advocate for volunteers. The Coordinator will represent the volunteers' point of view to the Reserve, inform staff about issues related to volunteers, and initiate action on such issues. The Coordinator will ensure adequate support and arrange for adequate space, furniture, equipment and supplies for volunteers. Another objective will be to develop new projects, participate in agency-wide program planning to assure proper involvement of volunteers and gather ideas for new volunteer projects and program expansion. This will entail developing professional resources, attending volunteer management workshops and conferences, and networking with other directors of volunteers.

e. Develop professional resources.

f. Develop in-service training for the volunteers and for the staff. Volunteers will be required to attend in-service training. In this way, volunteers will receive the adequate training to interact with Reserve staff and the public. These curricula will provide a basis of knowledge through invited speakers and programs and in-service activities and lectures by Reserve Staff. Additionally, the Volunteer Program will facilitate future volunteer involvement by curricula evaluation and providing the opportunity for volunteers to attend special events, workshops, tours, etc. The Volunteer Coordinator, thus, will be an integral component of both Reserve staff and the Weeks Bay Volunteer organization.

i. Provide motivation and appreciation activities for volunteers. Perhaps the most important component of a successful volunteer program is the acknowledgment and appreciation of volunteer activities. When individuals are recognized for the commitment and accomplishments to Reserve programs, it reflects the true value of volunteers. Because their input and support are so valuable, the Volunteer Coordinator plans recognition events in which all levels of Administration take part. This re-affirms the Reserve’s commitment to volunteers and the program, while fostering a friendly atmosphere that promotes courtesy, motivation, and productivity in the future. The coordinator plans these events, but also supports volunteers by writing letters of reference, promoting communication of activities and accomplishments through newsletters, bulletin boards, and meetings and suggests ways for Reserve staff to demonstrate appreciation of volunteers on a daily basis. It is the Reserve’s goal to recognize volunteers to maintain their level of commitment through daily affirmations.

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